

TCP/11/16(256)
Planning Application 12/01934/FLL – Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally, Blairgowrie, PH10 7JX

INDEX

- (a) Papers submitted by the Applicant (***Pages 591-836***)
- (b) Decision Notice (***Pages 839-840***)
 - Report of Handling (***Pages 841-858***)
 - Reference Documents (***Pages 617-835***)
- (c) Representations (***Pages 859-876***)
- (d) Written Submission (***Pages 877-882***)

TCP/11/16(256)

Planning Application 12/01934/FLL – Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally, Blairgowrie, PH10 7JX

**PAPERS SUBMITTED
BY THE
APPLICANT**



Pullar House 35 Kinnoull Street Perth PH1 5GD

Tel: 01738 475300

Fax: 01738 475310

Email: onlineapps@pkc.gov.uk

Applications cannot be validated until all necessary documentation has been submitted and the required fee has been paid.

Thank you for completing this application form:

ONLINE REFERENCE 000064870-001

The online ref number is the unique reference for your online form only. The Planning Authority will allocate an Application Number when your form is validated. Please quote this reference if you need to contact the Planning Authority about this application.

Applicant or Agent Details

Are you an applicant, or an agent? * (An agent is an architect, consultant or someone else acting on behalf of the applicant in connection with this application)

☐ Applicant ☒ Agent

Agent Details

Please enter Agent details

Company/Organisation:	VG Energy Ltd.
Ref. Number:	WV 1020
First Name: *	Erin
Last Name: *	Fairley
Telephone Number: *	01563 829999
Extension Number:	
Mobile Number:	
Fax Number:	
Email Address: *	Erin.Fairley@vgenergy.co.uk

You must enter a Building Name or Number, or both:*

Building Name:	Waterside Farm
Building Number:	
Address 1 (Street): *	Glasgow Road
Address 2:	Galston
Town/City: *	East Ayrshire
Country: *	UK
Postcode: *	KA4 8PB

Is the applicant an individual or an organisation/corporate entity? *

☒ Individual ☐ Organisation/Corporate entity

Applicant Details

Please enter Applicant details

Title: *	<input type="text" value="Miss"/>
Other Title:	<input type="text"/>
First Name: *	<input type="text" value="Erin"/>
Last Name: *	<input type="text" value="Fairley"/>
Company/Organisation:	<input type="text" value="VG Energy Ltd."/>
Telephone Number:	<input type="text" value="01563 829999"/>
Extension Number:	<input type="text"/>
Mobile Number:	<input type="text"/>
Fax Number:	<input type="text"/>
Email Address:	<input type="text" value="Erin.Fairley@vgenergy.co.uk"/>

You must enter a Building Name or Number, or both:*

Building Name:	<input type="text" value="Waterside Farm"/>
Building Number:	<input type="text"/>
Address 1 (Street): *	<input type="text" value="Glasgow Road"/>
Address 2:	<input type="text"/>
Town/City: *	<input type="text" value="Galston"/>
Country: *	<input type="text" value="East Ayrshire"/>
Postcode: *	<input type="text" value="KA4 8PB"/>

Site Address Details

Planning Authority:	<input type="text" value="Perth and Kinross Council"/>
---------------------	--

Full postal address of the site (including postcode where available):

Address 1:	<input type="text" value="The Corb"/>	Address 5:	<input type="text"/>
Address 2:	<input type="text" value="Bridge Of Cally"/>	Town/City/Settlement:	<input type="text" value="Blairgowrie"/>
Address 3:	<input type="text"/>	Post Code:	<input type="text" value="PH10 7JX"/>
Address 4:	<input type="text"/>		

Please identify/describe the location of the site or sites.

Northing	<input type="text" value="756832"/>	Easting	<input type="text" value="316408"/>
----------	-------------------------------------	---------	-------------------------------------

Description of the Proposal

Please provide a description of the proposal to which your review relates. The description should be the same as given in the application form, or as amended with the agreement of the planning authority: *

(Max 500 characters)

Erection of a single wind turbine (84m tip) with associated access track and meter house.

Type of Application

What type of application did you submit to the planning authority? *

- ☒ Application for planning permission (including householder application but excluding application to work minerals).
- ☐ Application for planning permission in principle.
- ☐ Further application.
- ☐ Application for approval of matters specified in conditions.

What does your review relate to? *

- ☒ Refusal Notice.
- ☐ Grant of permission with Conditions imposed.
- ☐ No decision reached within the prescribed period (two months after validation date or any agreed extension) – deemed refusal.

Statement of reasons for seeking review

You must state in full, why you are seeking a review of the planning authority's decision (or failure to make a decision). Your statement must set out all matters you consider require to be taken into account in determining your review. If necessary this can be provided as a separate document in the 'Supporting Documents' section: * (Max 500 characters)

Note: you are unlikely to have a further opportunity to add to your statement of appeal at a later date, so it is essential that you produce all of the information you want the decision-maker to take into account.

You should not however raise any new matter which was not before the planning authority at the time it decided your application (or at the time of expiry of the period of determination), unless you can demonstrate that the new matter could not have been raised before that time or that it not being raised before that time is a consequence of exceptional circumstances.

Objection to planning review officer refusal determination based upon perceived contravention of the local development plan.
Applicant/Agent seeking review of Council determination as proposal is deemed in compliance with the local development plan and national policy framework.

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 the new matter, 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: * (Max 500 characters)

Additional information is submitted in response to details of the handling report for application 12/01934/FLL, and as such councillor support and green target information was not in the original application.

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. You can attach these documents electronically later in the process: * (Max 500 characters)

Appeal statement, Original Environmental Report including appendix, Cumulative Landscape and Visual Impact Study including appendix, noise report, ecology report, meter house and turbine elevation.

Application Details

Please provide details of the application and decision.

What is the application reference number? *

12/01934/FLL

What date was the application submitted to the planning authority? *

05/11/12

What date was the decision issued by the planning authority? *

07/05/13

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.

Can this review continue to a conclusion, in your opinion, based on a review of the relevant information provided by yourself and other parties only, without any further procedures? For example, written submission, hearing session, site inspection. *

☐ Yes ☒ No

Please indicate what procedure (or combination of procedures) you think is most appropriate for the handling of your review. You may select more than one option if you wish the review to be conducted by a combination of procedures.

Please select a further procedure *

Holding one or more hearing sessions on specific matters

Please explain in detail in your own words why this further procedure is required and the matters set out in your statement of appeal it will deal with? * (Max 500 characters)

To allow representation and answer any technical questions about the development.

Please select a further procedure *

Inspection of the land subject of the appeal. (Further details below are not required)

Please explain in detail in your own words why this further procedure is required and the matters set out in your statement of appeal it will deal with? * (Max 500 characters)

To allow the review board to gain a better understanding of the development in context of the surrounding baseline landscape.

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

Can the site be clearly seen from a road or public land? *

☐ Yes ☒ No

Is it possible for the site to be accessed safely and without barriers to entry? *

☒ Yes ☐ No

If there are reasons why you think the Local Review Body would be unable to undertake an unaccompanied site inspection, please explain here. (Max 500 characters)

No Reason.

Checklist - Application for Notice of Review

Please complete the following checklist to make sure you have provided all the necessary information in support of your appeal. Failure to submit all this information may result in your appeal being deemed invalid.

Have you provided the name and address of the applicant? *

☒ Yes ☐ No

Have you provided the date and reference number of the application which is the subject of this review? *

☒ Yes ☐ No

If you are the agent, acting on behalf of the applicant, have you provided details of your name and address and indicated whether any notice or correspondence required in connection with the review should be sent to you or the applicant? *

☒ Yes ☐ No ☐ N/A

Have you provided a statement setting out your reasons for requiring a review and by what procedure (or combination of procedures) you wish the review to be conducted? *

☒ Yes ☐ No

Note: 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. 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.

Please attach a copy of all documents, material and evidence which you intend to rely on (e.g. plans and drawings) which are now the subject of this review *

☒ Yes ☐ No

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 (if any) from the earlier consent.

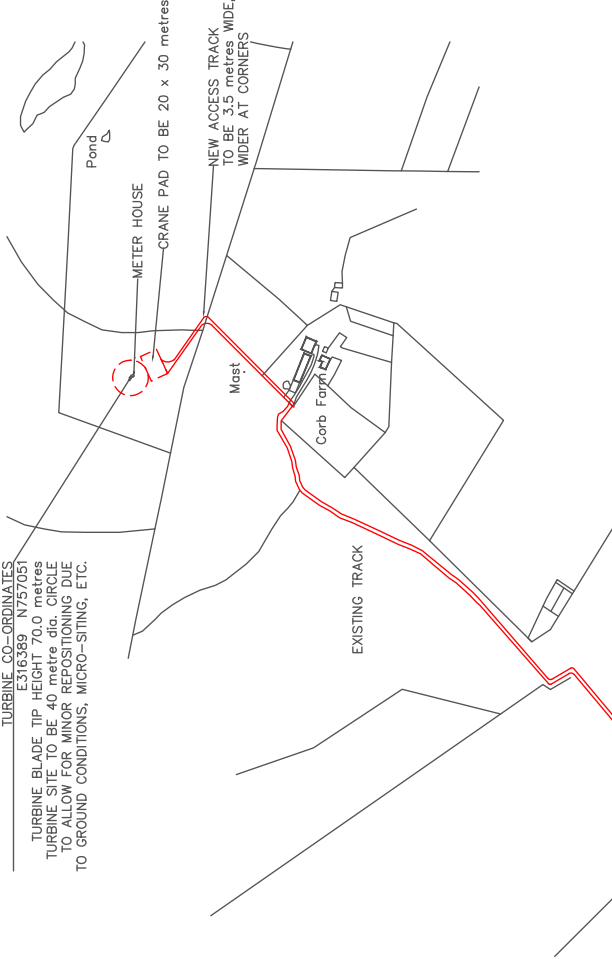
Declare - Notice of Review

I/We the applicant/agent certify that this is an application for review on the grounds stated.

Declaration Name: Erin Fairley

Declaration Date: 31/05/2013

Submission Date: 31/05/2013



APPLICATION SITE
AMOUNTS TO 8855
square metres

TURBINE CO—ORDINATES
E316389 N757051
TURBINE BLADE TIP HEIGHT 70.0 metres
TURBINE SITE TO BE 40 metre dia. CIRCLE
TO ALLOW FOR MINOR REPOSITIONING DUE
TO GROUND CONDITIONS, MICRO—SITING, ETC.



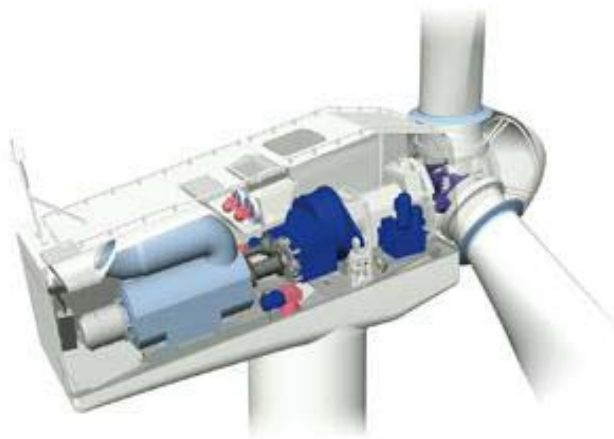
Renewable Technology Specialists

Waterside Farm
Glasgow Road
Gallatin
KA4 8PB
t: 01563 829990
f: 01563 829383
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk

PROJECT

PROPOSED ERECTION OF A 44 metre
GAMESA WIND TURBINE for MR BAILEY
at THE CORB FARM,
GLENSHEE, PH10 7JX

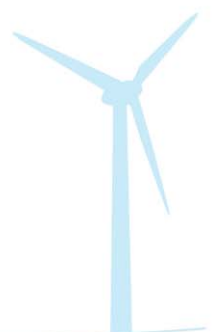
DRAWING NO.	REVISION
A002	
SCALE	DATE
1:6000	05/09/2012



The Corb
Appeal Statement
Ref: 12/01934/FLL
May 2013

Client: Mr N. Bailey

Site Location: The Corb
Bridge of Cally
Glenshee
Perthshire
PH10 7JX



Compiled by:

EF, BSc(Hons); and

CL, LMLI.

Planning & Environment Department

Signed off by: Dave Anderson

CONTENTS

1. Introduction 4

2. Council Decision..... 5

3. Review of Council Decision 6

4. Additional Information 11

5. Conclusion 15

APPENDIX 16

1. Introduction

This document is being submitted with the request for an appeal of the determination of planning application 12/01934/FLL: Erection of a wind turbine, meter house and associated access track (55m hub height, 84m blade tip height) located on land at The Corb, Bridge of Cally, Blairgowrie (Grid Coordinates: E: 316400 N: 757043).

This Appeal Statement has been prepared by VG Energy Ltd. on behalf of Mr N. Bailey.

Original documents submitted with planning application:

- Environmental Report;
- Zone of Theoretical Visibility Map (ZTV);
- Site Map;
- Detailed Site Plan;
- Meter House Detail;
- Ecological Report;
- Environmental Map;
- Archaeological Map;
- 5 x Photomontage/Wireframe visualisations;
- Viewpoint Locator Map; and
- 35km Wind Farm Proposals Map.

Documents were received by Perth and Kinross Council on 5th November, 2012.

Additional information requested by, and provided to, Council Review Officer and Consultee Landscape Advisor prior to Planning Determination:

- Addendum Cumulative Landscape and Visual Assessment Report;
- Cumulative Zone of Theoretical Visibility Map (CZTV);
- 9 x Cumulative Photomontage/Wireframe visualisations (5 new locations);
- 1 x Wireframe visualisation (new location);
- Viewpoint Locator Maps;
- 35km Wind Turbine Development Map;
- A94 Roadway Study – Wireframe visualisations; and
- A93 Roadway Study – Wireframe visualisations.

Documents were received by Perth and Kinross Council on 24th April, 2013.

2. Council Decision

The application [12/01934/FLL] was refused Planning Permission, with a decision date of 7th May, 2013.

Reasons for refusal:

1. *“The proposed siting of the turbine, remote from the existing turbine grouping at Drumderg Wind Farm, extends wind development along the Highland Boundary Fault to the detriment of visual amenity and landscape character. The proposal will also have a detrimental cumulative impact on landscape character. The Council is not satisfied that the energy contribution of the proposed turbine would outweigh the adverse effects on local environmental quality. Accordingly, the proposal is contrary to National Scottish Planning Policy (SPP), Policy 6 of the approved TAYplan 2012; and Policies 2, 9, 38 of the Eastern Area Local Plan 1998 and Policies PM1A, ER1A and ER6 of the Proposed Local Development Plan.*

Justification

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

3. Review of Council Decision

I. Appellant's Response to Refusal

This section sets out the appellants ground for appeal in response to the reasons for refusal.

To have a *significant adverse effect*, a development proposal would have to result in it producing a total loss or major alteration to key elements, features and characteristics of the baseline conditions. The baseline conditions of the Landscape Character Type (LCT) in which the proposed development is situated can be described as one impacted by localised large scale wind farming.

The greatest mitigation measure available to the applicant and agent of The Corb single turbine development within this LCT is the matching of like developments visually to minimise potential negative impacts to a level deemed acceptable by National and Local Standards.

Throughout the guided Design Development process with the Competent Authority (Perth and Kinross Council), all principles to mitigate impact (both physically and visually) per Local Council wind technology development strategies and Policies have been utilised, while understanding any limiting parameters of the landowner's property boundaries.

While the broad justification for refusal is set forth relating to perceived Policy Contravention, the reasoning as set forth in the Council Report of Handling determines:

1. "Landscape and Visual Impacts

Policy 9 of the Eastern Area Local Plan 1998 (EALP) is one of the key development plan policies in the determination of this renewable energy application. Criterion contained within the policy seeks to safeguard the intrinsic landscape quality of the area and prevent loss of amenity to neighbouring properties. There is a further requirement through policy 02 and 38 of the EALP as well as policy ER6 of the Proposed Local Development Plan (PLDP) to take account of the landscape.

The proposed site located within the Highland Summits and Plateaux landscape character type as described in the SNH Tayside Landscape Character Assessment (TLCA) 1999. Although not a statutorily protected landscape in terms of national, regional or local designations it is necessary to take account of the sites relationship to the Highland Boundary Fault (HBF) which forms a dramatic interface between the highland and lowlands which is an important landscape feature."

• Response: Physical Landscape Context

"The Highland Boundary Fault is a major fault zone that traverses Scotland from Arran and Helensburgh on the west coast to Stonehaven in the east. It separates two distinctly

different physiographic and geological terrains: the Highlands from the Lowlands, and in most places it is recognisable as a change in topography”¹.

This impressive visual line of mountainous terrain that dramatically defines the highland and lowland character areas runs for a distance of approximately 188km. Within the baseline context of the landscape impacted by wind farm technology in the study area, the combined façade of existing Drumderg Wind Farm and the neighbouring proposed Corb turbine would be approximately 1.26km of this. The resultant effect of these developments is an impact to 0.67% of the Boundary Fault. This is an impact that can be deemed acceptable in overall context of landscape scale.

In regards to neighbouring properties, it was requested by the Competent Authority that a targeted 2km residential study be conducted for scale of development. There are no neighbouring properties within this area of upland moorland, with the Corb residence (applicant’s property) currently significantly impacted by existing wind infrastructure (Drumderg Wind Farm). Given distance to concentrated groups of residential receptors within lowland areas and the intervening topography and land-use, there is no significant impact to wider residential amenity which is currently evident in the baseline conditions which contain operational Drumderg Wind Farm.

2. *“I am satisfied that the differing height of the turbine and varied rotational speed will not have a significant impact on visual amenity or landscape character. The position of the turbine in relation to the Drumderg Windfarm does, however, raise concerns.*

The applicant has submitted a total of 9 viewpoints and has concluded that overall the proposed turbine can be absorbed into the landscape and viewed as an acceptable part of Drumderg Windfarm.”

- **Response: Visual Impacts**

Of the nine (9) Photomontage/Wireframes and one (1) Wireframe visualisation submitted with the application, three (3) have been highlighted with concerns relating to significance of impact caused by separation distance between the proposed development and existing Drumderg Wind Farm.

- Knock of Balmyle Hill (3.65km distance to development) noted to be a walking area, though not easily accessible. Sensitivity of receptor has been marked down as such to *medium* with a *slight* impact to the existing baseline conditions (landscape with wind technology). The determination of *moderate/minor* significance of effect is fair.

- Creigh Hill (10.10km distance to development) again, noted to be a walking area with more defined trail access. Sensitivity of receptor reflects this at *medium to high* with a *slight* impact to existing baseline conditions (rotational views incorporating wind technology

¹Wikipedia, Highland Boundary Fault Line, http://en.wikipedia.org/wiki/Highland_Boundary_Fault

towards the west). The resultant determination of *moderate/minor* significance of effect is fair.

- Burrelton (20.26km distance to development) is a concentration of residential receptors within the Broad Valley Lowland landscape of Strathmore. The view is representative of those properties (and school) on the northern fringe of the settlement potentially impacted by development. Sensitivity of receptor has been set as *high* with a *negligible* impact to baseline conditions. Impact can be realistically determined as such given the +20km distance to existing wind technology (Drumderg Wind Farm) which does not dominate or unacceptably intrude on this town. The proposed Corb turbine does not provide an unsuitable or detrimental addition from this distance which would negatively impact on baseline amenity.

Remaining Photomontage and Wireframe visualisations which reflect an array of distances, orientations, elevations and receptors/sensitivities all show the acceptability of the proposed development into the baseline landscape, with agreement from the Competent Authority.

“Overall I consider the proposed turbine would compromise the existing composition of Drumderg, extend wind development to the west along the Highland Boundary Fault to the detriment of visual amenity and landscape character.”

It is noted that during this application process there have been a number of emotive wind farm applications within the vicinity of existing Drumderg which would see the introduction of large typology turbines into the more intimate neighbouring Landscape Character Type of the Highland Foothills, visually pulling development into the lowland area of Strathmore if consented.

It is understood that a thorough investigation of effects of development should always accompany a suitable Planning Application. Per guidance set forth by SNH, “Assessing the Cumulative Impact of Onshore Wind Energy Development (2012)”²:

33. The key principle for all cumulative impact assessments is to focus on the likely significant effects and in particular those which are likely to influence the outcome of the consenting process.

57. This is generic guidance only. The number of proposals in an area and the timing of applications give rise to development scenarios of varying complexity. Professional judgement should inform the scope of the study to be undertaken.

Initial pre-application meetings with the appointed Council Planning Officer determined suitable parameters for study identifying the main cumulative impact relative to existing Drumderg Wind Farm by dint of proximity.

²SNH, Assessing the Cumulative Impact of Onshore Wind Energy Developments, <http://www.snh.gov.uk/docs/A675503.pdf>

Through design development and subsequent planning meetings with the Council Landscape Advisor, it became apparent that concern was flagged over the larger, multi-turbine developments proposed within the more intimate landscape bordering Strathmore. The extent of study for the single Corb development was increased.

Further:

Within Section: "TOWN AND COUNTRY PLANNING – PART II OF THE REGULATIONS, Paragraph 12" of THE ENVIRONMENTAL IMPACT ASSESSMENT (SCOTLAND) REGULATIONS, 1999 – CIRCULAR 8, 2007³ it is noted:

12. Where the EIA procedure shows that a project will have an adverse impact on the environment, it does not automatically follow that planning permission must be refused. It remains the task of the planning authority to judge each planning application on its merits within the context of the Development Plan, taking account of all material considerations, including the environmental impacts.

As such, it should be noted significant effects as defined by this Scottish Government regulatory document as stemming from *major* or *major/moderate* landscape or visual effects determined through assessment need NOT BE unacceptable per varied parameters of site and area specifics and may be fully reversible.

While every project can be reviewed under the predetermined significance (effect) identified by use of significance matrices, it must be understood that such a matrix is solely a tool for quantifying and therefore the correct methodology and analysis of potential effects must make allowance for the utilisation of professional judgment.

It is strongly determined by the applicant, their agent (VG Energy) and shown through the level of assessment conducted for the application that while large scale development within this area would impact more significantly on the high sensitivity Highland Fault and multiple Landscape Character Types, the single turbine development of The Corb as proposed does not combine with existing infrastructure to an unacceptable adverse level in combination views from a range of differing orientations and distances.

Overall the proposed development would present a significance of effect of *moderate/minor* to landscape and visual amenity.

The determination of *moderate/minor* effect (and under) on landscape and landscape amenity is *non-significant* as specified in The Environmental Impact Assessment (Scotland) Regulations, 1999 (Circular 8, 2007).

³The Environmental Impact Assessment (Scotland) Regulations, 1999 – Circular 8 (2007)
<http://www.scotland.gov.uk/Resource/Doc/205337/0054660.pdf>

3. Roadway Study

The submission also includes a roadway study to demonstrate the impact of the proposed turbine as an individual travels through the area. The impact from the majority of roads in the area is considered negligible, however there are considered to be more substantial impacts from the A94. Travelling along the A94 from Perth to Forfar wind farm is evident within the upper landscape types which skirt the Strathmore valley in which the A94 sits. The submission states that The Corn (sic.) turbine will be visible from a 1.5km section north of Perth Airport heading north east to Balbeggie; a 7.8km section, 1km north of Balbeggie to the northern edge of Burrelton and again for a 5.3km section from the A90 junction at Forfar towards Glamis. This represents a potential impact to 33.5% of the overall distance between Perth and Forfar. Wireframes have been submitted to demonstrate views from three locations on the A94 to the south of Coupar Angus. These all demonstrate that the Corb turbine will be seen remote from the main grouping at Drumderg and therefore similar concerns as those identified under photomontage 1, 4 and 9 above exist for these road users. It is noted, however, that tree cover, hedges, walls etc. which skirt the roadway corridor will break views towards the turbine.

- **Response: Roadway Study**

The Council review of the roadway study and subsequent write up within the Handling Report (section above) highlights the low impact of development to the higher sensitivity Main Tourist Routes identified in Supplementary Planning Guidance (SPG) for Wind Energy Proposals in Perth & Kinross (2005), guidelines 1 and 3. Those which should be afforded maximum protection from negative impacts are: M90, A826, A822, A827, A85, A9, B8019, and B846.

The A94 trunk road between Perth and Forfar is an important link with a varied array of views from urban fringe, through prime strath agricultural land and policy/estate woodland with a mixture of contained views and open vistas to the expansive Highland Fault mountain range, running parallel to the roadway corridor.

The Handling Report (HR) refers to “similar concerns” of separation distance between developments within three of the 5 wireframes provided for potentially impacted stretches of this road.

These areas are ~20 to 30km from development. They are at an oblique angle to both directions of travel and impact a small percentage of angles of view. As is assessed and referenced in the HR, these are potential views and do not factor intervening land cover or man-made elements. The percentage of sections of road that are identified as impacted is therefore less. It is argued strongly that given the nature and speed of this road, such effect as evidenced in the baseline landscape (operational Drumderg) are not significant in impacting amenity of road users.

4. Additional Information

i. Timeline of Events

1st application - 12/01568/FLL

28th August, 2012 – Application received by Perth and Kinross Council, reference number 12/01568/FLL.

1st October, 2012 – [12/01568/FLL] Meeting held with Perth & Kinross Council Planning Officer- *Planning & Regeneration* to determine the parameters of study (baseline study area) and the approved methodology for assessing the impacts and effects of the proposed development on sensitive receptors and the landscape and visual amenity. All parties agree upon the methodology determined for appropriate study.

23rd October, 2012 – Confirmed support for larger turbine typology received from Perth & Kinross Planning Officer- *Planning & Regeneration* to help mitigate visual impacts of single turbine development in proximity to existing Drumderg Wind Farm.

- *“The 84m to tip turbine works more successfully in terms of its relationship to Drumderg and (I) believe it would be more prudent to move forward with that proposal... this would be considered a material change to the application and would require the withdrawal (sic.) of the current application and the submission of a new application with the landscape assessment updated to reflect our discussions. I would appreciate if you could confirm, in writing, your intention to withdraw the application or whether you wish me to continue to determine the smaller turbine.”⁴*

2nd Application - 12/01934/FLL

5th November, 2012 – Through coordination with the Planning Officer and in assessment of relevant Perth and Kinross Council submitted wind farm applications, the Environmental Report along with a full Landscape and Visual Impact Assessment is submitted for 84m (tip) turbine [12/01934/FLL].

16th November, 2012 – Uncharacteristically for this scheduled development (single turbine), as stated by Planning Officer, the Council Landscape Advisor is introduced and additional viewpoints and methodology are requested. (This is deemed by the acting agent to be out of context with the scale of development and perceived impacts and resultant effects as determined through the confirmed methodology of reporting).

- *“The Council’s Landscape Architect... has given me some comments on this application. He does not normally become involved in the applications for single turbines and usually*

⁴Electronic Communication, Sent from Perth & Kinross Tue 23/10/2012 16:30

comments on the larger schemes where an EIA has been requested, and that was why I didn't consider it necessary for him to be involved in any pre-application meetings which we had... I appreciate that the above is a significant amount of work for a single turbine project, however the proposed turbine location is in close proximity to a number of wind energy proposals and consents and its sensitive location close to the Highland Boundary Fault means that this level of study is required to make a proper assessment of the proposal.”⁵

15th January, 2013 – (After Holiday Period) Coordination meeting is held with Perth & Kinross Council Planning Officer- *Planning & Regeneration* and Council Landscape Advisor to review scale of development and scope of analysis for scheduled scale of Non-EIA project.

From this meeting the Photomontage/Wireframe viewpoints are agreed for Council determination of potentially re-locating the larger turbine typology to its original site location to allay Council Landscape Architect concerns regarding minor separation distance of the proposed development to Drumderg Wind Farm from two (2) upland locations – Creigh Hill and Balmyle Hill. This is the original location that Perth & Kinross flagged as having ecological impact concerns in initial Screening.

8th February 2013 – John Williamson receives the additional photomontages which were requested showing the turbine in the original position from screening (E: 316829 N: 756945).

12th February 2013 – Feedback from the council stating the approval/disapproval of the new turbine locations relating to the photomontages;

“Douglas and I have now had a chance to look over the submitted draft photomontages ... which sees the turbine moved further south ... For ease of reference this response is broken down into each viewpoint:

- *Keillour – No objection*
- *Balmyle – We still feel that the turbine from this viewpoint is remote from the main grouping at Drumderg and the degree of separation between the turbine and Drumderg is too significant. We feel the turbine should be moved further south so that the gap between it and Drumderg is similar to the gap between the existing turbines. Furthermore the new turbine also appears out of scale with the turbines at Drumderg from this viewpoint and this requires to be addressed.*
- *Creigh Hill (Blackwater Reservoir) - Similar concerns to the above in that the turbine is remote from the main group at Drumderg and requires to be moved further south so the spacing is reflective of the existing turbines at Drumderg*
- *Pitlochry Road – Whilst the preference here would be the turbine to be located below the horizon we do not have any significant concerns regarding this particular viewpoint.*
- *Kinpurney Hill – No objection*
- *Hill of Alyth – No objection*
- *Dunsinane Hill – No objection*

⁵Electronic Communication, Sent from Perth & Kinross Fri 16/11/2012 16:47

We still feel that the turbine requires to be moved further south in order for it to be considered acceptable particularly when viewed from Balmyre and Creigh Hill but we note that this may not be an option due to land ownership issues.”⁶

24th April 2013 – Council receive additional information requested by, and provided to, Council Review Officer and Consultee Landscape Advisor prior to Planning Determination. The document included:

- Addendum Cumulative Landscape and Visual Assessment Report;
- Cumulative Zone of Theoretical Visibility Map (CZTV);
- 9 x Cumulative Photomontage/Wireframe visualisations (5 new locations);
- 1 x Wireframe visualisation (new location);
- Viewpoint Locator Maps;
- 35km Wind Turbine Development Map;
- A94 Roadway Study – Wireframe visualisations; and
- A93 Roadway Study – Wireframe visualisations.

7th May 2013 - Application Refused.

ii. Review of Local Objection(s)

The first application [12/01568/FLL] which was submitted to Perth and Kinross Council received no objections from statutory consultees or members of the public. There are two (2) supporting comments from Councillor Bob Ellis and Murdo Fraser MSP. The supporting letters state;

- *“The single wind turbine will obviously not have any visual or environmental effect on the area as there are already numerous wind turbines in the immediate area on Drumderg ... The Drumderg windfarm has had an effect on Mr and Mrs Bailey’s property ... If their application is granted, then this would also assist them to receive other financial income, which would be of great benefit to them given their present circumstances, where they reside.”* – Councillor Bob Ellis
- *“I am writing in support of the application for a single wind turbine on Corb Hill submitted by Mr and Mrs Bailey. I have serious concerns about the proliferation of wind turbines across Perth and Kinross, and have objected to a number of large scale developments ... I understand the reasons why Mr and Mrs Bailey are submitting this application, and in particular blight on their property from the adjacent Drumderg windfarm. In the circumstances it would be quite unfair should their own application be refused.”* – Murdo Fraser, MSP.

In regards to the second application submitted [12/01934/FLL], there are no objections from statutory consultees or members of the public. There are three (3) supporting comments from

⁶ Electronic Communication, Sent from Perth and Kinross Council Tues 12/02/13 08:56

Councillor Bob Ellis, Councillor Caroline Shiers and Murdo Fraser MSP. The letters in support state:

- *"I would like to submit this letter as a letter of support for Mr and Mrs Norman Bailey on the above planning application. Although this single turbine is 14 metres higher than the previous application submitted to you it will still obviously not have any visual or environmental effect on the area as there are already numerous wind turbines in the immediate area on Drumderg and they are all in the region of 26 metres higher ... The Drumderg windfarm has had an effect on Mr and Mrs Bailey's property ... If their application is granted, then this would also assist them to receive other financial income, which would be of great benefit to them given their present circumstances, where they reside."* – Councillor Bob Ellis
- *"I write in full support of the above application for a single turbine on Corb Hill on environmental grounds. Given the proliferation of Wind Farms across Perth and Kinross and the proximity of this site to Drumderg Windfarm the visual impacts of a single turbine would be minimal."* – Councillor Caroline Shiers.
- *"I am writing in support of the application for a single wind turbine on Corb Hill submitted by Mr and Mrs Bailey. I have serious concerns about the proliferation of wind turbines across Perth and Kinross, and have objected to a number of large scale developments ... I understand the reasons why Mr and Mrs Bailey are submitting this application, and in particular blight on their property from the adjacent Drumderg windfarm. In the circumstances it would be quite unfair should their own application be refused."* – Murdo Fraser, MSP.

iii. Green Targets and Local Energy Targets

Based on census results, the population of Bridge of Cally is approximately 176⁷. In Perth & Kinross 5,296 Properties are occupied by 10,968 people⁸. Therefore assuming similar occupancy there are an estimated of 85 Properties in Bridge of Cally. Further to the estimate of properties in our area; the UK Electricity Consumption per Capita is 7.2MWh⁹ (19.7kWh per day). This means a Property with 2.071 occupants (Perth and Kinross Council average) uses 40.8kWh per day or 14,902kWh per annum.

Based upon manufacturer's specifications, a G58–500 produces, after losses, 2,570,474 kWh per annum at 7 m/s wind speed. Based on these figures, a G58-500 will potentially power 172 homes. As this is almost the equivalent electricity consumption of Bridge of Cally, this proposed development will effectively offset the area's carbon footprint associated with electricity demand. While it is understood that these houses may not directly benefit from the electricity produced by the turbine, this is representative of the carbon offset by such a development.

⁷ Bridge of Cally Population; [http://www.the-](http://www.the-glen.org.uk/images/uploads/Alyth%20&%20Mt%20Blair%20comm%20profile%20FINAL2009_compressed%20images.pdf)

[glen.org.uk/images/uploads/Alyth%20&%20Mt%20Blair%20comm%20profile%20FINAL2009_compressed%20images.pdf](http://www.the-glen.org.uk/images/uploads/Alyth%20&%20Mt%20Blair%20comm%20profile%20FINAL2009_compressed%20images.pdf).

⁸ Number of Properties in Perth and Kinross; <http://www.pkc.gov.uk/CHttpHandler.ashx?id=14341&p=0>.

⁹ UK Electricity Consumption per Capita; <https://www.gov.uk/government/publications/energy-consumption-in-the-uk>

5. Conclusion

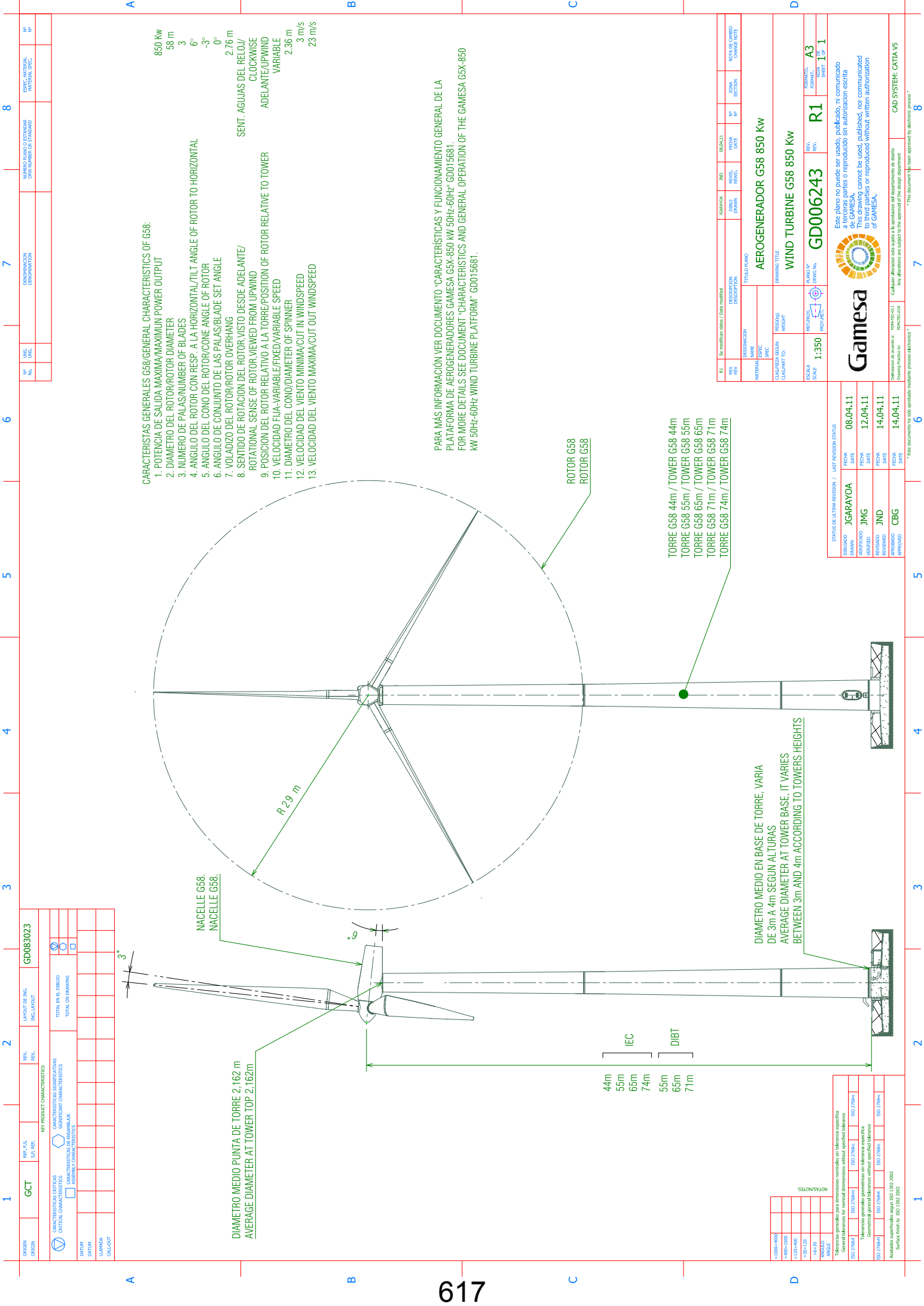
In conclusion, the appellant requests appeal on Perth and Kinross Council's decision to refuse application 12/01934/FLL, Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally.

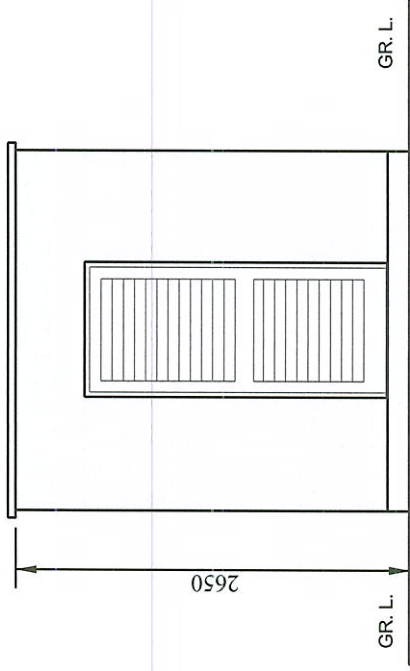
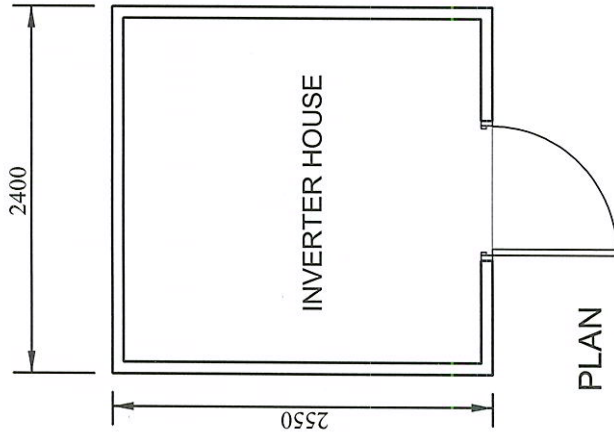
The appellant requests this appeal on the grounds that the proposed wind turbine will not have a significantly adverse impact on character and appearance of the Landscape Character Type (LCT), neighbouring LCTs or on the amenity of residential receptors, tourist receptors or other designated sensitive receptors found therein and as assessed in the application.

The additional information provided in this Statement further demonstrates the support for and the merit of a suitable single turbine development in the location proposed and that the resultant single/cumulative effects of this proposed development on landscape and visual amenity are not of a significance criterion to warrant the refusal on the broad grounds set forth by Council Planning Officer- *Planning & Regeneration* against the framework of Local Development Plan Policies.

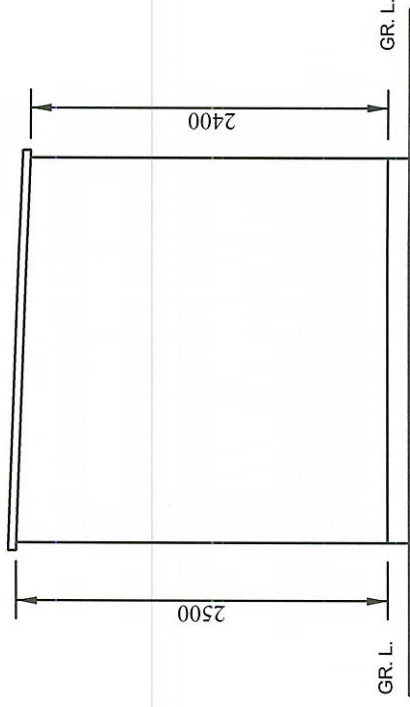
APPENDIX

- Figure 1:** Environmental Report
- Figure 2:** Cumulative Landscape and Visual Impact Assessment
- Figure 3:** Meter House Drawing
- Figure 4:** Gamesa Noise Report

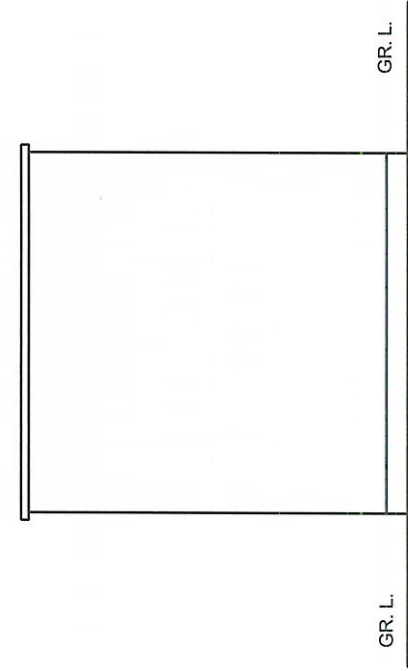




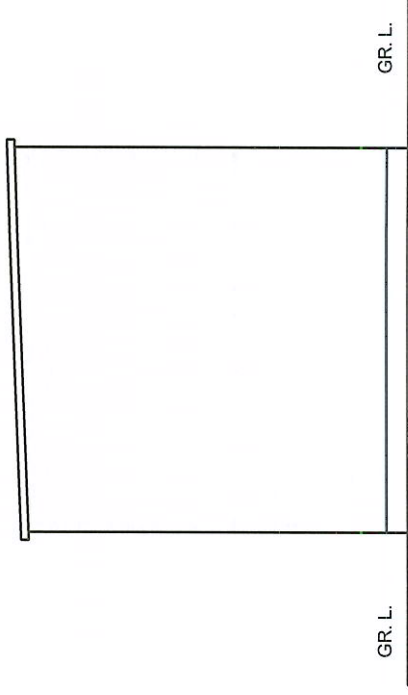
PROPOSED NORTH WEST ELEVATION



PROPOSED SOUTH WEST ELEVATION



PROPOSED SOUTH EAST ELEVATION

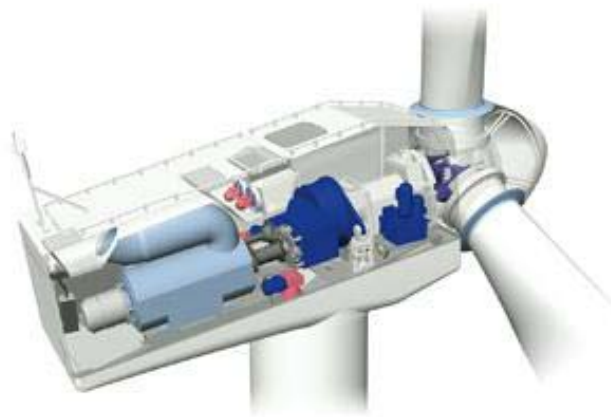


PROPOSED NORTH EAST ELEVATION

- BASE : 150mm C35 GRADE CONCRETE ON 1 LAYER VISQUEEN 1200 DPM
ON MINIMUM 100mm BLINDED AND COMPACTED HARDCORE.
- WALLS : 100mm DENSE CONCRETE BLOCK WITH 19mm WET DASH RENDER
- ROOF : PROPRIETARY PROFILED METAL SHEETING (coloured green)
- DOOR : 900 x 2000mm METAL LOUVRED

PROPOSED METER HOUSE

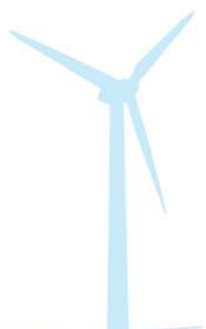
Scale :- 1:50



**Environmental Report for a Single Wind
Turbine Development at The Corb**

Client: Mr N. Bailey

Site Location: The Corb
Bridge of Cally
Glenshee
Perthshire
PH10 7JX



Compiled by:

Craig Macdonald BSc(Hons), PgDip, MSc;
Fraser Bell BA (Hons), MSc;
Graeme Wallace BA(Hons), MSc;
Siobhan Matthey BA(Hons), MSc, AIEMA;
David Anderson BSc(Hons);
Stephen Waters BSc(Hons), MSc;
Christopher McDonagh BA(Hons), MA;
Erin Fairley BSc(Hons);
Christopher Lockett BA;
Simon Knott BSc, PGDip;
Heather Chambers MSc, MChem(Hons);
Rob Mayers, BA(Hons), PGDip
Craig Bosworth BEng, MSc;

Planning & Environment Department**Prepared by:** Erin Fairley**Edited by:** Chris Lockett**Approved by:** David Anderson**Disclaimer:**

© Copyright 2012 VG Energy Limited. All rights reserved.

No part of this report may be copied or reproduced by any means without prior written consent from VG Energy Limited. If this report has been received in error, please destroy all copies in possession and notify VG Energy Limited at the above address.

This report has been prepared for the exclusive use of the named client and unless otherwise agreed in writing by VG Energy, no other party may use, make use of or rely on the contents of the report. No liability is accepted by VG Energy Limited for any use of this report, other than for the purpose for which it has been written.

The information and opinions provided in this report have been developed from the expertise of VG Energy Limited using due diligence, skill, care and attention to detail in its preparation and production. It should be noted, however, that no independent verification of any of the information supplied to VG Energy Limited has been made, unless expressly stated otherwise.

Contents

1.	INTRODUCTION	6
i.	Planning Application.....	6
ii.	Applicant Information	6
2.	PROJECT DESCRIPTION	8
i.	Site Selection	8
iii.	Turbine Specifications	9
iv.	Site access.....	9
v.	Grid Connection.....	10
vi.	Decommissioning	10
3.	RELEVANT PLANNING POLICY	11
i.	Environmental Impact Assessment	11
ii.	National Planning Policy and Legislation	11
iii.	Local Council	12
4.	SOCIO-ECONOMIC ASSESSMENT	21
i.	Location	21
ii.	Demographics.....	21
iii.	Access	21
iv.	Local Businesses	22
v.	Recreation and Tourism	22
vi.	Tourism in Perth and Kinross.....	22
vii.	Impacts	23
viii.	Public Perception.....	23
ix.	Socio-Economic Effects.....	24
5.	LANDSCAPE AND VISUAL ASSESSMENT	25
i.	Introduction.....	25
ii.	Project Description	26
iii.	Planning Application.....	27

iv.	Baseline Study Meeting	28
v.	Methodology	28
vi.	Study Area	31
vii.	Landscape Context	31
viii.	Landscape Designations and Policy	37
ix.	Landscape Impact	47
x.	Visual Assessment	50
xi.	Mitigation	61
xii.	Residual Impacts.....	61
xiii.	Do Nothing or Alternative Scenario:.....	62
6.	GEOLOGICAL, SOIL AND HYDROLOGICAL ASSESSMENT	63
i.	Geology.....	63
ii.	Soils.....	65
iii.	Hydrology	67
7.	ECOLOGY	69
i.	Methodology	69
ii.	Designated Environmental Sites near to The Corb.....	71
iii.	Potential Impacts.....	75
iv.	Mitigation Measures	76
8.	CULTURAL HERITAGE AND ARCHAEOLOGY	78
i.	Background.....	78
ii.	Methodology	78
iii.	Designated Historical and Archaeological Sites near to The Corb.....	82
iv.	Mitigation Measures.....	92
9.	NOISE ASSESSMENT	94
10.	SHADOW FLICKER	97
11.	AVIATION EFFECTS.....	98
12.	TRAFFIC AND TRANSPORT	99
13.	DELIVERY AND CONSTRUCTION ACCESS ROUTE	101

14.	EXISTING INFRASTRUCTURE	102
15.	GENERAL SAFETY	103
	APPENDIX A	104
	APPENDIX B	104
	APPENDIX C.....	104

1. INTRODUCTION

i. Planning Application

This Environmental Report is being submitted as part of a Planning Application to Perth and Kinross Council for the installation of a single Gamesa G-58, 850kW wind turbine at The Corb, Bridge of Cally. A Screening Opinion Request (Ref. 12/00233/PREAPP) was submitted for this proposal, a reply to which was received on the 16th of April 2012, stating that an EIA was required. Following on-site assessment by VG's Ecology department and the relocation of the turbine, the proposal was reassessed by the Council (12/00819/SCRN), a reply to which was received 22nd May 2012, stating that an EIA was no longer required.

The original application [12/01568/FLL] for a 70m (tip height) turbine was withdrawn on the 24th October, 2012. This was through discussion with Perth and Kinross Council to allow for the re-submitting of the current application for increased typology.

The proposed turbine will have a tower height of 55 metres (m), a blade diameter of 58m and height to blade tip of 84m. This report outlines an evaluation of the potential impacts the proposed development may have on the various aspects of the environment including: landscape, ecology, hydrology, cultural heritage, shadow flicker and noise.

The proposed site is located on farmland belonging to Mr N. Bailey, approximately 11km northwest of Alyth. This Environmental Report has been prepared by VG Energy Ltd on behalf of Mr Bailey. This application for planning consent is made under the Town and Country Planning (Scotland) Act (as amended) 2006.

ii. Applicant Information

The applicant runs The Corb Farm as a thirty acre smallholding. The site previously farmed thirty-five ewes, with the offspring rams finished and sold for meat and the ewes sold to four local farms for livestock. There was also a stock of seventy free-range chickens with the eggs sold to six local hotels and Bed & Breakfast accommodations. A stock of two-hundred breeding rabbits was also kept, originally to supply Sainsbury's supermarket with meat and latterly Pets at Home for consumer purchase. All livestock was reared to UK welfare standards and conditions were inspected by a Sainsbury's processor. The small holding was funded entirely through self-sufficiency and no grants or subsidies were ever applied for by Mr Bailey. Retirement in December 2010 led to the winding down of these business interests and The Corb is now grazed by several pet sheep and the steading houses around twenty chickens.

The income generated from the turbine has been ear-marked by the applicant to fund his twin granddaughters' university education. Both girls have been moved towards an application for Cambridge University with combined tuition fees of £18,000 per year. Each girl is expected to take a student loan for the estimated £5,500 living costs which cannot be supplemented as Undergraduates at Cambridge University are forbidden to take part-time work during their

period of study. Assuming a load factor of 20% with the Feed-in Tariff and energy income inflation of 2.5% per annum (reasonable because Drumderg achieves around 23% and RPI is usually over 3%), Mr Bailey has calculated that the income from the turbine will cover university costs and latterly provide security in future years. Mr Bailey had intended to sell his own property and down-size in order to provide a significant contribution towards his granddaughters' higher-education. However, due the erection of Drumderg Wind Farm five years ago, two estate agents have informed Mr Bailey that his house is unsalable and the possibility of down-sizing has been negated. The loss of value on the property was estimated to be £100,000 in 2006. On the 1st April 2008, Mr Bailey was the first person in the UK to have a reduction in Council Tax banding due to the presence of a nearby wind farm.¹ As the area has already been deemed suitable for turbine development, Mr Bailey has made steps to move towards this source of income from renewable energy in order to provide funding for the education of his granddaughters as well as providing a contribution to the Scottish Government's renewable energy targets.

¹ Scottish Assessors Association, PH10 7JX Council Tax bandings,
http://saa.gov.uk/tayside/search.php?SEARCHED=1&SEARCH_TABLE=council_tax&ASSESSOR_ID=tayside&SEARCH_TERM=PH10+7JX

2. PROJECT DESCRIPTION

i. Site Selection

The site selected consists of land located at an elevation of approximately 384m Ordnance Datum (OD), and is likely to have a good wind resource. The proposed development site is located 220m to the northwest of the farmstead, and circa 2.6km east of Bridge of Cally. The topography of the site is undulating grass moorland, sloping downward in a westerly direction.

The location of the turbine was chosen mainly due to:

- Topography – whilst the turbine is not situated at the highest point on the farm, (which is in the north, approximately 397m OD), it is well placed to receive a good wind resource;
- Ecology – the turbine is an appropriate distance (at least 50m) from any potential wildlife habitats, such as trees and hedgerows. In addition, it is close to an existing access track running along the north of the field, therefore reducing the development's footprint;
- Nearby structures – the turbine is a safe distance from the nearest buildings, approximately 220m south;
- Landscape and visual impacts – Drumderg Windfarm is located circa 1km east of farm, thereby reducing the visual impact created by a single turbine development as the landscape already encompasses views of turbines;
- Hydrology - the turbine has been sited a minimum of 50m from the nearest issue;
- Noise – the turbine is located a sufficient distance from nearby noise sensitive receptors, as the closest residential dwelling not owned by the applicant is approximately 2.2km south of the development.

The northwest fields have been identified as the most suitable for a new turbine. As such, the location chosen represents the best option available: It is a safe distance from the unnamed road to the east, yet is placed close enough to this so that the upgrade required to the existing access track running along the north of the field is minimal – reducing the development's footprint and ensuring the field remains productive farmland. The site is also restricted due to the proximity of the Dun Moss SAC. The proximity of which was of a significant enough concern for Perth & Kinross Council to initially request a full EIA for the proposal. However, by siting the turbine in its current location mitigates the need for a full EIA.

ii. The Proposed Development

The proposed project has been designed with the intention of generating zero-carbon electricity through the utilisation of wind as a renewable energy source. The development will require the infrastructure associated with the wind turbine itself, an on-site control unit system and a meter house. The project will also require new access track and crane pad which will be built at the foundation of the turbine for component lifting.

iii. Turbine Specifications



FIGURE 1: GAMESA TURBINE

The turbine details as proposed for this project are shown below:

TABLE 1: TURBINE SPECIFICATIONS

No. of Turbines	1 x Gamesa G58
Hub Height	55m
Rotor Diameter	58m
Height to blade tip (max.)	84m
Generating capacity	850 kilowatts (kW)
Colour	Light grey, matt finish.

iv. Site access

Existing road networks will be used to deliver the materials required for the turbine to be constructed. Proposed access to the site is required from an un-named minor road south of the farmstead running northwest from Alyth. A new access track will be required from this minor road to the turbine base where a crane pad will be constructed. The track will be 5m wide (wider at turns) and will be created using stone aggregate (Type 1). The crane pad will be

approximately 30m by 20m and will also be created using stone aggregate (Type 1). A number of local contractors will be considered to carry out the building of the access road. The soil where the track will be located will be tested before the depth of the road is determined; although it is thought that the maximum depth will not exceed 60cm. Since the track and crane pad will be constructed of compacted stone aggregate, surface water run-off will be limited due to the permeable nature of the material. This should negate the need for detailed site drainage designs. When construction is completed the track will be left in place to allow for any maintenance work to be carried out.

A detailed site access plan will be produced prior to the works taking place.

v. Grid Connection

The turbine will be connected to a single storey meter house via underground cabling. The underground cabling will be laid adjacent to the access track, and the meter house will be situated adjacent to the turbine.

Connection to the national grid will not be considered as part of this Planning Application as consent falls under another process, and the environmental legislation surrounding it is separate from that which is covered in this assessment. The planning application for connection to the national grid will be carried out independently.

vi. Decommissioning

The operational period will be set at 25 years and provision for the turbine to be decommissioned will take place on the expiration of the planning permission. The site will be restored within 6 months of this time unless planning permission is sought for the extension of the operational period. Any application for extension must be done so in accordance with the legislation and regulations surrounding the development at the time of applying. If an extension for operation is not sought then it is common practice for all equipment which is above ground to be removed from the site completely after having been dismantled.

The disassembled turbine parts can mostly be recycled and will be taken to a suitable recycling plant. Another option is the decommissioned turbine to be refurbished and sold on the second hand market. At this time the turbine foundations will be removed and the area above this will be re-instated. The cables, which will be laid inside ducting, can be easily pulled out the ground leaving only the ducting in-situ. Once again, the cabling can be recycled at a suitable recycling plant. Access tracks may be covered by topsoil or left in as they are if they are beneficial to the landowner.

3. RELEVANT PLANNING POLICY

i. Environmental Impact Assessment

There is a statutory obligation for an EIA to be undertaken if deemed necessary by the Local Planning Authority. The level of assessment required should correspond to the scale of the development, as defined by the EIA Directive. As this turbine is 84m to tip height, a screening opinion was sent to Perth and Kinross Council.

In response the Council confirmed that an EIA would not be required. However the Council did state the following –

“The visual impacts if a proposal of this scale and nature will require careful assessment at application stage ... A full landscape assessment will need to form part of any planning application”;

“A visual assessment should also include an appraisal of wider cumulative effects and the relationship to the operational Windfarm at Drumderg”;

“A phase 1 ecological appraisal + walkover of the site should be submitted ... early consultation with RSPB in relation to the Forest of Alyth SAC and the Dun Moss SSSI should be fully examined”;

“There are a number of features of archaeological interest in the vicinity of the site. You may wish to liaise with Perth and Kinross Heritage Trust ahead of the completion of any assessment”.

This report will give a comprehensive account of the above issues while also considering other environmental, social and economic aspects within the study area.

The projects development has been refined in order to avoid or reduce any foreseeable potential environmental conflicts. Potential impacts associated with all stages of the development, from construction through to decommissioning, have been thoroughly analysed. Where necessary, mitigation measures have been designed to alleviate any impacts as much as is feasibly possible and will be discussed below.

ii. National Planning Policy and Legislation

a. Legislation

The Scottish Government is committed to increasing the amount of electricity generated from renewable energy sources as a vital part of the response to climate change and in line with the European Commission’s Renewable Energy Directive (RED) 2009.

The Climate Change Delivery Plan (Scottish Government, 2009) committed Scotland to generating 20% of all energy and 50% of all electricity from renewable sources by 2020. This

target has since been increased through the Routemap for Renewable Energy in Scotland 2011,² which sets out the goal of renewables providing the equivalent of 100% of the Country's gross annual electricity consumption by 2020. In addition, 500 MW of renewable energy should be community and locally-owned by 2020, which includes rural businesses. Onshore wind has been recognised as having the ability to make a very large contribution towards these goals. It should also be noted that the above targets are not considered to be a cap and that regional targets have not been set by the Scottish Government.

Electricity suppliers are also responsible under the Renewable Obligation (Scotland) Order 2002 to ensure that a certain proportion of the electricity they supply to consumers in Scotland comes from an eligible renewable resource.

b. Planning Policy

In regards to planning, Scottish Planning Policy (SSP, published in February 2010) supports the installation of a wide range of renewable energy technologies to help achieve the above targets, including energy storage. Paragraphs 182-195 of the SPP relate to renewable energy technologies.³ The purpose is to mainly provide guidance for local development plans set out by each local authority and is therefore taken into account in the chapter below. It is specified that planning authorities should support small businesses in developing renewable energy initiatives in an environmentally acceptable way: It is not perceived that the proposed turbine development at The Corb will cause an unacceptable environmental impact.

The following policies have been considered from the initial stages of this development:

- Renewables Advice – onshore wind turbine (2011)⁴
- Pan 58 Environmental Impact Assessment⁵
- PAN 73 Rural Diversification⁶
- National Planning Framework for Scotland 2 (NPF2)⁷

Small-scale onshore wind energy production, such as the development proposed here, is to be encouraged in order to help both Scottish and National renewable energy targets. This type of development improves business efficiency, helps to reduce carbon emissions and improves the sustainability of the local energy supply.

iii. Local Council

The Corb is within the boundary of Perth and Kinross Council, and as such will help the Council contribute to the Scottish Government's climate change targets through reducing the local

² 2020 Routemap for Renewable Energy in Scotland: <http://www.scotland.gov.uk/Publications/2011/08/04110353/0>

³ Scottish Planning Policy: <http://www.scotland.gov.uk/Publications/2010/02/03132605/0>

⁴ <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables>

⁵ <http://www.scotland.gov.uk/Publications/1999/10/pan58-root/pan58>

⁶ <http://www.scotland.gov.uk/Publications/2005/02/20638/51727>

⁷ <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/npf/>

economy's reliance on fossil fuels and lowering carbon emissions. In Perth and Kinross, the renewable energy technologies that offer the greatest potential, at least in the short term, in addition to the existing large-scale hydro schemes, are wind energy, small-scale hydro and the use of forest residues. Modern wind energy technologies and developments offer opportunities in supporting and developing the economy of Perth and Kinross to our benefit. With the constrained areas of Perth and Kinross removed, it is estimated that the available area for wind developments is some 757km² (14%) of the land area of Perth and Kinross⁸.

a. Implemented Policy

The proposed development is located within the Bridge of Cally area within Perth and Kinross Council. The following policies from the Development Plan relate to wind farm and renewable energy development and are taken into account within this planning application:

- Eastern Area Local Plan 1998;
- Supplementary Planning Guidance for Wind Energy Proposals in Perth and Kinross 2005; and
- Proposed Local Development Plan 2012.

Eastern Area Local Plan (1998)

Policies relating to this development have been outlined below and include;

Policy One and Policy Two which outlines sustainable and general development;

- POLICY ONE (Sustainable development): *The council will seek to ensure, where possible, that the development within the plan area is carried out in a sustainable manner. Where the development is considered to be unsustainable but has other benefits to the area which outweigh the sustainable 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 the sustainability of projects:-*
- *Renewable resources should be used within the limits of their capacity for regeneration; and*
- *The quality of the environment as a whole should be maintained and improved.*

A single wind turbine at The Corb will be used within their capacity for regeneration. As well as this, this Environmental Report has highlighted that the quality of all aspects of the environment has been identified, analysed, and where possible, mitigation measures have been put in place.

- POLICY 2 (General Development):

⁸ Wind Energy Facts;

[http://www.pkc.gov.uk/Planning+and+the+environment/Greener+living/Renewable+energy/Wind+farms+\(planning+and+building\)/](http://www.pkc.gov.uk/Planning+and+the+environment/Greener+living/Renewable+energy/Wind+farms+(planning+and+building)/)

- *All developments within the Plan area not identified as a specific policy, proposal or opportunity will also be judged against the following criteria:-*
- *Rural sites should have a landscape framework capable of absorbing or, if necessary, screening the development; where required, opportunities for landscape enhancement will be sought;*
- *The development should be compatible with its surroundings in land use terms and they should not result in significant environmental damage or loss to the amenity or character of the area;*
- *The road network should be capable of coping with traffic generated by the development and satisfactory access on to that network provided; and*
- *The site should be large enough to accommodate the development satisfactorily in site planning terms.*

This development is compatible with its surroundings as there is the sixteen turbine wind farm of Drumderg present. As well as the presence of the wind farm, it has been noted throughout this Environmental Report that there will be no significant environmental damage or loss of amenity due to the development. Ecological walkovers have been completed, cultural heritage has been fully analysed and assessed, and the landscape and visual impacts will be moderately adverse due to the presence of existing wind farm technology within the Landscape Character Type.

As the wind farm is already present, there are suitable access tracks readily available to cope with the loads needed for the delivery of the proposed turbine.

- *POLICY 9 (Renewable Energy): The council will encourage, in appropriate locations, developments which contribute towards the Scottish Renewables Obligation. In the absence of a detailed Council wind policy on renewable energy production, developments will be assessed against the following criteria:-*
- *The Council will encourage, in appropriate locations, developments which contribute towards the Scottish Renewables Obligation. In the absence of a detailed Council wide policy on renewable energy production, developments will be assessed against the following criteria:-*
- *That provision can be made for construction traffic, without danger to road traffic safety or the environment;*
- *That the development will not have a significant detrimental effect on sites of nature conservation or sites of archaeological interest;*

- *That the development will not result in an unacceptable intrusion on the intrinsic landscape quality of the area;*
- *That the development will not result in a loss of amenity to neighbouring occupiers by reasons of noise emission, visual dominance, electromagnetic disturbance or reflected light; and*
- *The cumulative impact of having two or more windfarms in the same area will be considered.*

The proposed transmission lines between the development and the National Grid will be considered an integral part of the development and their impact will also be assessed in relation to the above criteria. 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.

As stated, the existing wind farm of Drumderg is present within the landscape; therefore there will be minor impact upon the landscape and visual amenity. A full assessment has been carried out under the 'Landscape and Visual Impact' chapter of this report. A full assessment and analysis has been carried out on archaeological sites within 5km of the proposed turbine location. A full assessment of this can be found in the 'Cultural Heritage and Archaeology' chapter of this report.

There will be no detrimental impacts upon neighbouring properties as the turbine has been sited to mitigate noise effects and shadow flicker, and to minimise visual dominance.

- POLICY 20, 21 and 22 (Archaeology)
- *The council will safeguard the settings and archaeological landscapes associated with Scheduled Ancient Monuments (protected under the Ancient Monuments and Archaeological Areas Act 1979)*
- *The council will seek to protect unscheduled sites of archaeological significant. Where development is proposed in such areas there will be a strong presumption in favour of preservation in situ and where in exceptional circumstances preservation of the archaeological features is not feasible, the developer, if necessary though appropriate conditions attached to planning consents, will be required to make provision for the excavation and recording of threatened features prior to development commencing.*
- *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.*

The ‘Cultural Heritage and Archaeology’ chapter of this report analyses fully any detrimental impacts upon the sites of archaeological significance in the area. Where possible, mitigation measures can be applied, this may include a watching brief to ensure no sites of archaeological significance are impacted by this development.

- POLICY 47 (Historic Gardens and Designed Landscapes):
 - *The Council will protect and seek to enhance the Historic Gardens and Designed Landscapes identified on Proposals Map A and any others which may be identified by Historic Scotland and Scottish Natural Heritage during Plan period.*

There are no Gardens and Designed within the 5km study area of the proposed turbine development, but the Garden and Designed Landscape of Craighall is situated circa 8km south. However, due to the separation distance and intervening topography, there will be no impact upon this site.

Supplementary Planning Guidance for Wind Energy Proposals in Perth and Kinross

Guideline One – Landscape Impact *advises that wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse impact on landscape character which cannot be mitigated.*

As reported in the landscape and visual assessment chapter, there is a minor adverse visual impact of the turbine as it located next to the sixteen turbine wind farm of Drumderg.

Guideline Two – Visual impact *advises that wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse impact on visual impact which cannot be mitigated.*

Again, as reported in the landscape and visual assessment chapter, the visual impact upon the single turbine at the Corb will have minor adverse effect.

Guideline Three: Cumulative landscape and visual impacts *advises wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse cumulative impact on important receptors. A commercial or community wind farm, cluster or turbine when located within 40km of another is unlikely to be acceptable where it has not been demonstrated, to the satisfaction of the Council, that the cumulative landscape and visual impact will be slight or not significant. The Council will encourage developers to co-operate over the exchange of information, where cumulative assessment has been identified as important and is needed in order to make such assessments.*

As the single turbine development is situated within the proximity of Drumderg Wind Farm, it is perceived the cumulative impact of this turbine will have a minor adverse effect on the landscape and visual amenity of the area.

Guideline Four – Biodiversity *advises wind energy proposals will be supported except in locations where they would have a significant adverse impact on biodiversity.*

The Corb single turbine development is located in a property boundary close to the Forest of Alyth SAC and Dun Moss SSSI. Consultation with SNH and walkover surveys have been carried out by trained in-house ecologists. The findings of the walkover survey can be found in appendix C.

Proposed Local Development Plan (2012)

- POLICY HE1A and B (Scheduled Monuments and Non—Designated Archaeology):
 - *HE1A – Scheduled Monuments: There is a presumption against development which would have an adverse effect on the integrity of a Scheduled Monument and its setting, unless there are exceptional circumstances.*
 - *HE1B – Non-Designated Archaeology: The Council will seek to protect areas or sites of known archaeological interest 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 the granting of planning permission, will be required to make provision for the survey, excavation, recording and analysis of threatened features prior to development commencing. If discoveries are made during any development, work should be suspended, the local planning authority should be informed immediately and mitigation measures should be agreed.*

There is a designated Scheduled Ancient Monument (SAM) located 800m from the proposed turbine site. Full impact and effect of the proposed development on this site have been assessed in Chapter 8 of this Environmental Report, Cultural Heritage and Archaeology.

- Policy NE1B (National Designations): *Development which would affect a National Scenic Area, Site of Special Scientific Interest or National Nature Reserve, will only be permitted where the Council as Planning Authority is satisfied that:*
 - a) *The proposed development will not adversely affect the integrity of the area or the qualities for which it has been designated; or*
 - b) *Any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.*
- Policy NE4 (Green Infrastructure): *Development will contribute to the creation, protection, enhancement and management of green infrastructure by the:*

- a) *Incorporation of green infrastructure into new developments, particularly where it can be used to mitigate any negative environmental impact of the development; and*
- b) *Protection of the countryside from inappropriate developments whilst supporting positive use for agriculture, recreation, biodiversity, health, education and tourism.*

As can be seen from chapter (ecology) there is no concern over ecological impact of the turbine on the international/national designations within 20km of the proposed turbine. This indicates that the proposal is consistent with the Councils Local Plan and as such cannot be viewed as contrary to this policy.

➤ Policy ER1 (Renewable and Low Carbon Energy Generation): *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 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;*
- d) *Any positive or negative effects they may have on the local or Perth & Kinross economy either individually or cumulatively; and*
- e) *The reasons why the favoured choice over other alternative sites has been selected.*

- (i) The proposal will have no effect on such sites (as per chapter (landscape and ecology));
- (ii) The erection of a wind turbine will contribute to the Scottish Government's target of renewable energy, and will meet the carbon reduction targets;
- (iii) As per the traffic and transport chapter, there will be no implications for site access and road safety;
- (iv) The proposed turbine will have a positive effect on the local economy as there will be money spent in the local community during installation and maintenance of the turbine;
- (v) The site selected is the most favoured choice as any other location would have a detrimental visual impact.

Proposals for the development of renewable or low carbon sources of energy by a community may be supported where the development does not meet all of the above requirements provided it has been demonstrated that there will not be significant environmental effects and the only community significantly affected by the proposal is the community proposing and developing it.

- Policy ER5 (Conservation of Landscape Character): *States that development proposals should take account of the guidance provided by the Tayside Landscape Character Assessment and where appropriate will be considered against the following criteria:*
- a) *Sites selected should be capable of absorbing the proposed development to ensure that it fits into the landscape;*
 - b) *Where required, landscape mitigation measures should be in character with, or enhance, the existing landscape setting;*
 - c) *New buildings/structures should respect the pattern, scale, siting, form, design, colour and density of existing development;*
 - d) *Priority should be given to locating new development in towns, villages or building groups in preference to isolated development.*

As can be seen within Chapter 5, Landscape and Visual Impact Assessment, there is no concern over the visual impact of the turbine on the local landscape and the nearby town of Alyth. This indicates that the proposal is consistent with the Councils Local Plan and as such cannot be viewed as contrary to this policy.

- Policy ER6 (Managing Future Landscape Change to Conserve and Enhance the Diversity and Quality of the Area's Landscapes): *States the development and land use change 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 and 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 and 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, 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 and Kinross through design solutions with low light impact.*

The points listed above, have been analysed to the fullest extent in Chapter 5, Landscape and Visual Impact Assessment. This includes all impacts, be them beneficial or adverse.

Other policies which may affect development in the area include:

- Policy EP1 (Climate Change, Carbon Reduction and Sustainable Construction): *Sustainable design and construction will be integral to new development in Perth and Kinross. Applications for development may require a Sustainability Statement to demonstrate how developments will uphold sustainable construction principles and contribute to mitigating and adapting to climate change and to meeting targets to reduce carbon dioxide emissions. Consequently, all relevant applications must be accompanied by a sustainability statement and label under the Building Standards Technical Handbook Section 7 – Sustainability.*
- Policy EP8 (Noise Pollution): *States that development which adversely affects health, the natural or built environment or general amenity as a result of an unacceptable increase in noise levels will not be permitted unless there is an overriding need which cannot be accommodated elsewhere. Proposals for development generating unacceptable noise levels will not generally be permitted adjacent to existing or proposed noise sensitive land uses.*

Based on the above policy context, there will be no issue of noise, as the nearest sensitive noise receptor has financial incentive in the project.

4. SOCIO-ECONOMIC ASSESSMENT

The following section provides a brief overview of the area surrounding the proposed development. The site is located within the local authority of Perth and Kinross Council which has a population of 134,949⁹.

i. Location

The Corb is located approximately 5.7km north of Bridge of Cally and 2.7km east of the A93. The A93 road is a major route within the region running from Perth in the south and terminating in Aberdeen.

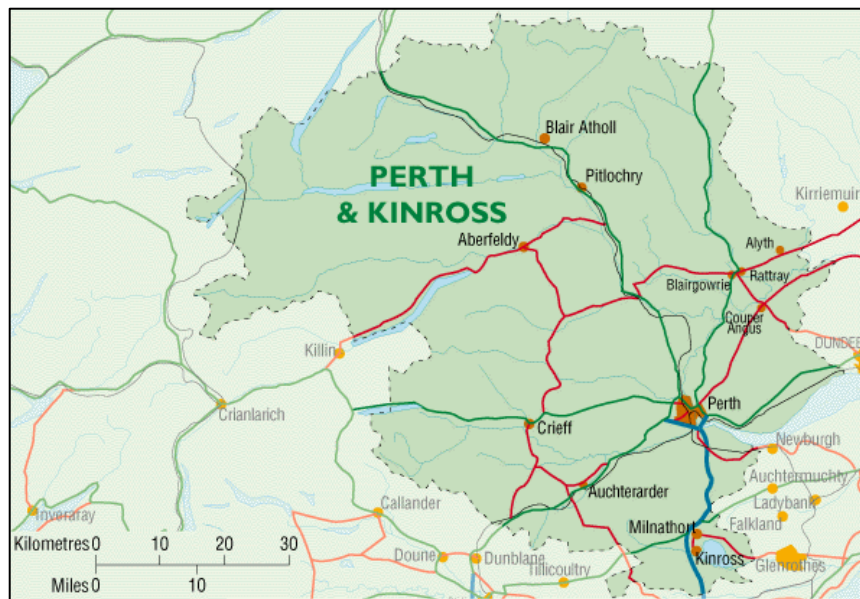


FIGURE 2: MAP OF PERTH AND KINROSS LOCAL AUTHORITY AREA¹⁰

ii. Demographics

The largest town in the region is Perth with an estimated population of 43,450. Other large settlements in the vicinity of The Corb include Alyth and Blairgowrie, with populations of 2,301 and 7,965 respectively.¹¹

iii. Access

The major access route in the region is the M90 which runs from Inverkeithing, just north of the Forth Road Bridge, to Perth. As well as the A93 the A9, A90 and A85 are all major transport routes within the region.

⁹ SCROL, Perthshire population 29.04.2011,

<http://www.scrol.gov.uk/scrol/browser/profile.jsp?profile=Population&mainArea=Perth+%26+Kinross&mainLevel=CouncilArea>

¹⁰ Dundee University, Unitary Authorities, Fife, <http://www.trp.dundee.ac.uk/data/councils/nc16.html>

¹¹ SCROL, Scotland's census results 29.04.2011, <http://www.scrol.gov.uk/scrol/common/home.jsp>

iv. Local Businesses

According to the Scottish Assessors Association¹² the main businesses within the Bridge of Cally area is as follows.

TABLE 2: BUSINESSES IN VICINITY OF PROPOSED TURBINE

Business Name	Address	Business Type
TAY DISTRICT SALMON FISHERIES BOARD	CRAIGTON BLEATON HALLET BRIDGE OF CALLY BLAIRGOWRIE, PERTHSHIRE PH10 7JX	SALMON FISHING RIGHTS

Although this business does, to some extent depend on tourism, it is not heavily reliant on the visual amenity of the surrounding landscape. A single turbine at The Corb is unlikely to be detrimental to this business as the turbine is too far away to affect it through noise or shadow flicker and the Zone of Theoretical Visibility (Appendix A, Figure 3) shows that topography will screen the development from the River Ardlie and the River Ercht.

v. Recreation and Tourism

To date there is no evidence to suggest that wind turbines have an adverse effect on tourism. Wind farms have become increasingly popular, with tourists and locals alike visiting a number of wind farms across the UK. Whitelee wind farm, Ayrshire, and the Ecotech Centre, Norfolk, have proven to be popular attractions; with Whitelee alone attracting over 120,000 visitors in its first year. MORI conducted a study on “Tourist Attitudes towards Wind Farms” which states that *“when [participants of the survey were] asked whether the presence of wind farms had a positive or negative effect, two in five (43%) maintained that it had a positive effect, while a similar proportion felt it was equally positive and negative. Less than one in ten (8%) felt that it had a negative effect”*.¹³

vi. Tourism in Perth and Kinross

Perth and Kinross has many tourist attractions and activities which range from hill walking and horse riding, to abseiling and white water rafting. Winter activities in Perthshire include skiing and snowboarding. The council area of Perth and Kinross encompasses a large area, with different areas covering different aspects of tourism. Aberfeldy, Blairgowrie and Pitlochry concentrates on water based activities including canoeing, kayaking and rafting; however there are nature trails and horse riding also available in these areas.

¹² Scottish Assessors Association, <http://www.saa.gov.uk/>

¹³ BWEA, Tourist Attitudes towards Wind Farms, <http://www.bwea.com/pdf/MORI.pdf>

The Bridge of Cally area offers walking trails, such as the Catheran Trail, which is 104km long and encompasses Blairgowrie and Alyth. The Bridge of Cally has a hotel and shop and offers a possible place to split both the first and final stages of the walk. Nearby is a B&B which offers a drop-off pick-up service throughout the length of the Catheran Trail.

The main tourism in the area of Bridge of Cally is walking trails. Bridge of Cally is in close proximity to Glenshee, which offers snowboarding and skiing in the winter months. As well as tourism in the area, the A93 is a significant tourist route as the corridor through the valley links Aberdeen in the North of Blairgowrie, which is a scenic route.

vii. Impacts

Owing to the small scale of the development, it is anticipated that there will be little impact of recreation and tourism in the Bridge of Cally area. In addition, Drumderg Windfarm is also located within this landscape, reducing the impact of the development as wind energy is an existing element in the landscape. The majority of tourism in this area is concentrated on hill walking, mountain biking and in winter, snowboarding and skiing is available in the Glenshee Valley. There are many trails and walking paths which include access to the Cairngorm National Park. The Catheran trail (104km) is one of the major trails in the area, encompassing areas such as Bridge of Cally, Blairgowrie and Alyth. The turbine will have no significant impact on the tourism and recreation activities in the area, due to the scale of the development in close proximity to a wind farm landscape.

viii. Public Perception

In order to gain an indication of public attitudes towards wind power in the UK, Ipsos MORI recently conducted research for RenewableUK using an online panel in April 2012.¹⁴ This involved 1,009 adults, (aged between 16 and 64), from across the UK. Ipsos Mori's online panels follow ESOMAR's code of conduct and use a pre-recruited group of individuals who are screened to ensure representative samples.¹⁵ The results, summarised below, show that the UK public support wind energy:

- 66% of respondents either strongly favour or tend to favour the use of wind power in the UK: This contrasts to only 8% who strongly or tend to oppose wind energy;
- 43% believe that the average UK household contribution of their energy bill¹⁶ towards wind energy as part of the Renewables Obligation is very or fairly good value and 25% believe it is average value: Only 19% feel it is very or fairly poor value;
- 59% perceive that the benefits of wind energy include helping to reduce carbon emissions and the UK's dependence on fossil fuels: Only 8% fail to see any benefit at all;

¹⁴ RenewableUK Wind Power Omnibus research: <http://www.ipsos-mori.com/researchpublications/researcharchive/2946/RenewableUK-Wind-Power-Omnibus-research.aspx>

¹⁵ Ipsos Mori's online panels (see link to i-Omnibus too):
<http://www.ipsos-mori.com/researchtechniques/datacollection/online/onlinepanels.aspx>

¹⁶ Calculated by Ofgem for financial year 2010/2011 as £7.74

- 66% believe that the visual impact of wind farms on the landscape are more acceptable than not.

From another study by YouGov and The Sunday Times,¹⁷ it appears that climate change and environmental issues are still very much supported by the majority of the public. Of the 1,696 adults from across the UK surveyed in September 2011, 56% wanted to see more wind farms in the UK. Only 19% of survey respondents wanted to see less emphasis on wind power. When asked about other forms of energy, just 35% of survey respondents believed more nuclear was the way forward, while only 16% believed the number of coal power stations should be increased. 60% of respondents thought the government is right to subsidise wind farms to encourage more wind power.

ix. Socio-Economic Effects

As the scale of the development is relatively small, the turbine has the potential to generate a limited range of social and economic effects. The opportunities are listed as follows:

- Pre-construction – contract opportunities for various specialists;
- Construction – opportunities for haulage, access track and turbine base construction, supply of building materials, electrical services and fencing contractors. The construction team may require the use of local accommodation and amenities, resulting in a short term boost to the local economy;
- Operation – the owner of the turbine; and
- Decommissioning – similar benefits as that of the construction stage.

To summarise, there will be a short to medium term improvement in employment created by the additional spend of income and wages in to the local economy and purchase of materials. Employment opportunities may arise down the supply chain by the companies providing services to this development. The turbine will require regular maintenance over its life span which will create employment opportunities with the potential to contract local individuals.

¹⁷ YouGov Plc & Sunday Times (2011):

http://cdn.yougov.com/cumulus_uploads/document/gm4jg0973n/Sunday%20Times%20Results%20111125%20VI%20and%20Trackers.pdf

5. LANDSCAPE AND VISUAL ASSESSMENT

i. Introduction

The purpose of this landscape and visual impact assessment is to ascertain the probable effects of the proposed turbine at The Corb, Bridge of Cally, be them beneficial or adverse, on the existing landscape and visual environments. Important factors to be considered include the landscape characteristics, sensitivity and visual amenity of the area.

Landscape impact may be defined as: Changes in the physical landscape, which may give rise to changes in its character and how it is experienced.

Visual impact comprises the change in the composition of available views from dwellings and public areas resulting from the proposals.

As recognised through the Wind Energy Policy Guidelines, Supplementary Planning Guidance for Wind Energy Proposals in Perth & Kinross (2005)¹⁸, a wind turbine or farm will always impact the landscape to some degree, influencing its character and views, because the scale of most turbines are taller than other natural or manmade features.

Although the turbine being considered at The Corb is a single turbine development compared to those installed at local area wind farms, its impact must still be fully analysed as both a stand-alone development, and cumulatively, with other wind turbines in the area. Turbines such as this are important in meeting the energy needs of the future through providing a local, clean energy source; this positive must be weighed against the landscape and visual impacts of the development.

Nevertheless, concluding on the acceptability of this proposal is difficult as the judgement will always be subjective. In order to make this as unbiased as possible, the development will be considered alongside specific policies and material considerations, such as the sensitivity and capacity of the landscape, and the significance of the impact.

¹⁸ Perth & Kinross Council, Planning, Wind Energy Policy Guidelines, Supplementary Planning Guidance for Wind Energy Proposals in Perth & Kinross (2005), http://www.pk.gov.uk/NR/rdonlyres/856EF5E6-B08F-457A-9CEC-DA6F2DFE96ED/0/WindEnergy_SPG_May2005.pdf

ii. Project Description

1. Site Description

The Corb farm is a thirty acre smallholding located approximately 5.7km north of Bridge of Cally, 10km north of Blairgowrie, 11km northwest of Alyth and 2.7km east of the A93 road corridor (a major route within the region, running from Perth in the south and terminating in Aberdeen).

Located within the constraints of the land owner's property, the proposed turbine is sited in a field of unimproved upland moor grass, used historically for sheep grazing.

The sixteen (16) turbine wind farm of Drumderg is located 1km to the southeast of the Corb site and these turbines are the dominant structures within the Lower Highlands Summits landscape character type (LCT).

An illustration of the site layout and a detailed site drawing is provided in the Appendix documents.

2. Site Selection

The site selected consists of land located at an elevation of approximately 384m (AOD), and is likely to have a good wind resource. The proposed development site is located 220m to the northwest of the farmstead. The topography of the site is undulating grass moorland, sloping downward in a westerly direction.

The location of the turbine was chosen mainly due to:

- Topography – whilst the turbine is not situated at the highest point on the farm, (which is in the north, approximately 397m OD), it is well placed to receive a good wind resource;
- Ecology – the turbine is an appropriate distance (at least 50m) from any potential wildlife habitats, such as trees and hedgerows. In addition, it is close to an existing access track running along the north of the field, therefore reducing the development's footprint;
- Nearby structures – the turbine is a safe distance from the nearest buildings, which lie approximately 220m south;
- Landscape and visual impacts – Drumderg Wind Farm is located circa 1km southeast of The Corb, thereby reducing the significant visual impact created by a single turbine development, incorporated into the wind farm landscape;
- Hydrology - the turbine has been situated a minimum of 50m from the nearest issue;

- Noise – the turbine is located a sufficient distance from nearby noise sensitive receptors, as the closest residential dwelling not owned by the applicant is approximately 2.2km south of the development.

The northwest fields have been identified as the most suitable for a new turbine. As such, the location chosen represents the best option available: It is a safe distance from the unnamed road to the east, yet is placed close enough to this so that the upgrade required to the existing access track running along the north of the field is minimal – reducing the development's footprint and ensuring the field remains productive farmland. The site is also restricted due to the proximity of the Dun Moss SAC. The proximity of which was of a significant enough concern for Perth & Kinross Council to initially request a full EIA for the proposal. However, by siting the turbine in its current location mitigates the need for a full EIA.

iii. Planning Application

A Screening Opinion Request (Ref. 12/00233/PREAPP) was submitted for the original project proposal, a reply to which was received on the 16th of April 2012, stating that an EIA was required. Following on-site assessment by VG's Ecology department and the relocation of the turbine, the proposal was reassessed by the Council (12/00819/SCRN), a reply to which was received 22nd May 2012, stating that an EIA was no longer required.

The original application [12/01568/FLL] for a 70m (tip height) turbine was withdrawn on the 24th October, 2012. This was through discussion with Perth and Kinross Council to allow for the re-submitting of the current application for increased typology. It was determined through detailed analysis and site work, with production of area visualisations that an increase in turbine typology to that proposed would fit better within this wind farm landscape, allowing potential negative visual effects of the single turbine to be mitigated by proximity to existing Drumderg Wind Farm.

The proposed turbine will have an increased tower height of 55 metres (m), a blade diameter of 58m and height to blade tip of 84m, seeing an overall increase in blade tip height of 14m. This report outlines an evaluation of the potential impacts the proposed development may have on the landscape, visual amenity and identified sensitive receptors.

This Landscape and Visual Impact Assessment has been prepared by VG Energy Ltd on behalf of Mr N. Bailey. This application for planning consent is made under the Town and Country Planning (Scotland) Act (as amended) 2006.

iv. Baseline Study Meeting

On the 1st October, 2012 a meeting was held with Perth & Kinross Planning Officer- Planning & Regeneration to determine the parameters of study (baseline study area) and the approved methodology for assessing the impacts and effects of the proposed development on sensitive receptors and the landscape and visual amenity. All parties agreed upon the methodology as set forth in section ii).

v. Methodology

The methodology for this assessment is, as best practice states, flexible and follows current guidance including:

Scottish Government Policies and Publications:

- Scottish Executive (1999) *Planning Advice Note 58. Environmental Impact Assessment*;
- Scottish Executive (2000) *National Planning Policy Guidance 6: Renewable Energy Technologies*; and
- Scottish Executive (2010) *Scottish Planning Policy (SPP)*¹⁹

Scottish Natural Heritage Policy and Guidance:

- Countryside Agency & SNH (2004) *Landscape Character Assessment, Guidance for England and Scotland*;
- Countryside Agency & SNH,(2004) *Landscape Character Assessment - Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity*;
- Scottish Natural Heritage (2001) *Guidelines on the Environmental Impacts of Windfarms and Small Scale Hydroelectric Schemes*;
- Scottish Natural Heritage (2003) *SNH Policy Statement No 02/03: Policy on Wildness in Scotland's Countryside*;
- Scottish Natural Heritage (2005) *Cumulative Effect of Windfarms; Version 2 revised 13.04.05*;

¹⁹ Scottish Planning Policy found: <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/newSPP>

- Scottish Natural Heritage (2005) *Environmental Assessment Handbook, 4th edition*;
- Scottish Natural Heritage (2009). *SNH Policy Statement No. 02/02: Guidance on Onshore Renewable Energy*;
- Scottish Natural Heritage (2009) *Siting and Designing Windfarms in the Landscape*;
- Scottish Natural Heritage (2012) *Assessing the Cumulative Impact of Onshore Development*; and
- Scottish Natural Heritage (2012) *Assessing the Impact of Small-scale Wind Energy Proposals on the Natural Heritage*.

Regional & Local Development Planning and Supplementary Planning Guidance:

- Eastern Area Local Plan (1998)²⁰;
- Supplementary Planning Guidance for Wind Energy Proposals in Perth & Kinross (Approved May 2005)²¹;
- TAYPlan, Strategic Development Plan (2012 - 2032)²²; and
- Proposed Local Development Plan (2012)²³.

Visual Representation and Reporting Aids:

- Landscape Institute & Institute of Environmental Management & Assessment (LI-IEMA: 2002) *Guidelines for Landscape and Visual Impact Assessment*. 2nd Edition; and
- Landscape Institute (2011) *Photography and Photomontage in Landscape and Visual Impact Assessment*.

²⁰ Perth & Kinross Council, Planning, Eastern Area Local Plan (1998), <http://www.pkc.gov.uk/NR/ronlyres/B669DCFB-5860-4962-92F6-8BA8A613AC51/0/EasternAreaLocalPlan1998.pdf>

²¹ Perth & Kinross Council, SPG for Wind Energy Proposals (2005), http://www.pkc.gov.uk/NR/ronlyres/856EF5E6-B08F-457A-9CEC-DA6F2DFE96ED/0/WindEnergy_SPG_May2005.pdf

²² TAYPlan, Strategic Development Plan: <http://www.tayplan-sdpa.gov.uk/FINAL%20Approved%20Plan%20June%202012%20low%20res.pdf>

²³ Perth & Kinross Council, Planning, Proposed LDP: <http://www.pkc.gov.uk/NR/ronlyres/DA293134-FE22-4937-BCB9-DC8950DA90EE/0/ProposedPlanforweb.pdf>

The methodology for this study involved carrying out a baseline study of the existing landscape resources and visual amenity, following the best practice guidelines set out in the *“Guidelines for Landscape and Visual Impact Assessment”* referenced above.

A desktop study has been undertaken to collect data on the existing landscape including landscape character and landscape designations.

The likely Zone of Theoretical Visibility (ZTV) has been created using Resoft WindFarm software. This has been used to identify the potential extent of the visual envelope and to help pick representative viewpoints. A ZTV highlights where a wind turbine may be visible from within a specified area surrounding the development, taking into account local topography. In regards to this proposal, the ZTV has been calculated to a 30km radius, taking into account views to the hub height of the turbine, and to the blade tip, (see Appendix, Figure 1). The ZTV has been calculated at 2m above ground level, which is higher than the mean height of UK citizens.²⁴ However, ZTVs are used to provide an indication of turbine visibility only, as they are limited in a number of ways. For example, the area highlighted does not allow for potential views through upper floor windows; nor does it take into account other factors that may screen the turbine from view, such as vegetation, buildings or field walls; lastly, it does not specify whether the whole turbine can be viewed, or just a small part of it – although calculations to both hub height and blade tip aim to reduce this uncertainty.

The ZTV was then used to select representative viewpoints. Field visits were undertaken and photos were taken from these viewpoints. Field visits also allow for a more detailed assessment of the existing landscape, visual amenity and likely potential impacts of the development than the desktop study alone. Following field visits, photomontages were developed using these photos on WindFarm Release 4 software. These photomontages are investigated below and have been attached to the Appendix (see Figures 3 through 7). These have been compiled as per industry standards regarding photography and visual representation.

The scale of potential direct and indirect impacts of the proposed wind technology development have been assessed with resultant effects and an assessment of the turbine’s significance upon the following at the various stages of the development: Landscape Character Type (LCT); Landscape Designations; visual receptors; landscape and visual amenity sensitivity.

Appropriate mitigation measures have been used, where possible, to reduce any predicted potential negative effects of the turbine to the greatest extent possible.

The turbine’s lifespan is expected to be approximately 25 years, so for the basis of this assessment it has been assumed that all impacts and effects assessed are medium to long term, as it will be possible to return the land to its former use after turbine decommissioning. This may change if the turbine were to be disassembled prior to this time, which may reduce the predicted impacts and effects of this proposal.

²⁴ Approximately 1.8m: <http://www.guardian.co.uk/uk/2002/aug/28/science.research>

Potential impacts on historical sites or cultural features and their setting are discussed in Chapter 8 of the Environmental Report: Cultural Heritage and Archaeology.

vi. Study Area

A study area of 20km was chosen in line with best guidance and industry standard. The turbine is unlikely to cause significant visual or landscape impact beyond 15km, with potential effects expected to be mostly confined to 10km of the site. Cumulative impacts with other developments will be considered out to 20km.

vii. Landscape Context

1. Landscape Character

The landscape character of the study area is considered at both regional and local level. The basis of the landscape character area assessment is taken from a study undertaken for SNH of the Tayside Landscape Character²⁵ (Landscape Character Assessment) and associated area map²⁶. This publication, together with field studies, forms the basis of the landscape character assessment and potential impacts and effects of the proposed turbine. Text taken directly from the Landscape Character Assessment (LCA) report is highlighted in italics.

Regional Character Area:

The study area is within the Highland Summits and Plateaux landscape type (3) and Mounth Highlands Regional Character Area, as defined by the SNH Landscape Character Assessment for the region:

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-glaciation 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.

²⁵ SNH, Landscape Character Assessment, Tayside, <http://www.snh.org.uk/publications/on-line/LCA/tayside.pdf>

²⁶ SNH, Landscape Character Assessment, Tayside, Map, <http://www.snh.org.uk/publications/on-line/LCA/maps/tay.pdf>

Mounth Highlands

The Mounth Highlands form a more continuous area of upland with a series of spurs extending southwards towards Strathmore.

Key Characteristics:

- *Areas of upland separating the principal glens;*
- *West Highlands comprise distinct summits and ranges, separated by fault lines 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;*
- *Building materials reflecting geological transition; and*
- *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:*
 - *Broadleaf: 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*
- *Rock outcrops, glacial features, expansive views*

Other Character Areas within the study area:

Highland Glens (1):

Within that part of Tayside to the north of the Highland Boundary Fault, glens formed by the combination of glacial and river erosion provide one of the principal structural elements in the landscape. They also provide the focus for most human activity. In undertaking the landscape assessment, a distinction has been made between the upper, mid and lower sections of the glen.

Mid Highland Glens (1b), Approximately 3km Northwest:

This landscape type comprises the middle sections of the most significant Highland Glens. These sections of glen are distinguished by the concentration of agricultural activity on the narrow valley floor, and the predominance of rough grazing, bracken and heather moorland on the valley slopes. Within the Mounth Highlands, this landscape type occurs in Glen Esk, the valley of the West Water, Glen Clova, Glen Prosen, Glen Isla, Glen Shee, Strathardle and Glen Tilt. Within the West Highland Mountains, it occurs at Glen Errochty, Dun Alastair (between Lochs Rannoch and Tummel), Strathbraan, Glen Lyon and Glen Artney.

Key Characteristics:

- *Middle sections of the principal Highland Glens;*
- *Concentration of agricultural activity on narrow, but distinct valley floor;*
- *Predominance of rough grazing, bracken, heather moorland on valley slopes;*
- *Rapids, gorges and waterfalls where bands of harder rocks occur;*
- *Glacial and post glacial features including morainic deposition;*
- *Native birch and oak woodland;*
- *Moderately settled;*
- *Proliferation of forts and castles;*
- *Substantial areas of commercial coniferous forestry.*

Objective Description: Highlands Foothills

- *Physical scale: 0.5 to 1km wide floodplain*
Valley floor 100-200 meters AOD
Valley sides rise to 300-600 meters AOD
Gorges and falls where harder rocks cross the glen
- *Woodland:*
 - *Broadleaf: Native birch and oak woodland on steeper and poorer ground*
 - *Coniferous: Substantial areas of plantation*
- *Agriculture:*
 - *Arable: Almost entirely absent*
 - *Pasture: Improved pasture on the valley floor, rough pasture on lower/mid slopes*
 - *Fields: Small, irregular, reflecting landform*
 - *Field boundaries: Dry-stone dykes and post-and-wire fences*
- *Settlement pattern: Scatter of farmsteads and small villages, located to avoid flooding and to maximise shelter/sunlight*
- *Building materials: Schists and granite with slates*
- *Historic features: Castles, old farmsteads*
- *Natural heritage features: Native woodlands, gorge vegetation*
- *Other landscape features: Waterfalls, glacial deposition features*

Lower Highland Glens (1c), Approximately 1.8km West:

This landscape type comprises the lower sections of the most significant Highland Glens. These sections of glen are distinguished by their comparatively large scale, and the particular combination of upland and lowland attributes. Most of the glens within the Mounth Highlands change rapidly from upper and mid glen to the lowland and foothills, so this landscape type only occurs in Strathardle. Within the West Highland mountains, however, it occurs in Glen Garry around Blair Atholl, joining with the Strath Tummel and Strath Tay between Aberfeldy and Dunkeld.

Key Characteristics:

- *Lower sections of the principal Highland Glens;*
- *Comparatively large-scale landscapes;*
- *Combinations of upland and lowland attributes;*

- *Broad floodplains, often with meandering rivers, interspersed with narrower, gorge-like sections where harder rocks cross the glens;*
- *The most settled parts of the glens;*
- *Farmland on valley floor and slopes;*
- *Substantial and varied woodland cover;*
- *Influence of large estates, castles and Victorian development.*

Objective Description: Highlands Foothills

- *Physical scale: 0.5 to 1km wide floodplain
Valley floor 50-200 meters AOD
Valley sides rise to 500 meters AOD
Gorges and falls where harder rocks cross glen*
- *Woodland:*
 - *Broadleaf: Extensive: comprising semi-natural woodland on steeper slopes and managed estate woodland*
 - *Coniferous: Extensive: on valley sides and associated with estates*
- *Agriculture:*
 - *Arable: Lower/mid valley sides and drained valley floor*
 - *Pasture: Valley floor and upper slopes*
 - *Fields: Large and rectilinear on valley floor, medium and rectilinear on gentler valley slopes*
 - *Field boundaries: Shelterbelts and post-and-wire fences on floodplain, hedges, trees and walls on valley slopes*
- *Settlement pattern: Well settled with villages and large estates, some planted villages*
- *Building materials: Transitional – granite, schist, slate and some sandstone*
- *Historic features: Castles, lodges and estate features*
- *Natural heritage features: Native woodlands, gorge vegetation*
- *Other landscape features: Waterfalls, glacial deposition features*

Highland Foothills (5), Approximately 4.5km Southeast to South:

Along the Highland Boundary Fault, at the foot of the Mounth Highlands, a series of foothills mark the transition to the lowland of Strathmore. Dissected by the rivers that flow out of the highland glens, the Highland Foothills landscape type forms a series of units running eastwards from Dunkeld to Edzell.

Key Characteristics:

- *Complex geological structure resulting from their position along the line of the Highland Boundary Fault;*
- *Glacial deposits;*
- *Steep whale backed hills and south-west to north-east valleys;*
- *Winding, gorge-like main river valleys;*
- *Gateway to the Angus Glens with a rich historic heritage;*
- *Building materials reflecting geological transition; and*
- *Complex, sometimes disorientating landscape with glimpses of Highland and lowland.*

Objective Description: Highlands Foothills

- *Physical scale: Climbing from about 100 metres at their southern edge to summits between 300 and 400 metres AOD*
- *Woodland:*
 - *Broadleaf: Scattered areas of woodland*
 - *Coniferous: Small to medium sized coniferous plantations, often geometric in form*
- *Agriculture:*
 - *Arable: On gentler, lower slopes, particularly along northern edge of Strathmore*
 - *Pasture: Extensive areas of pasture*
 - *Fields: Medium, regular shaped where landform permits*
 - *Field boundaries: Hedges, sometimes heathy in character and some dry-stone walls*
- *Settlement pattern: Settlement concentrated on low ground, particularly where rivers have cut corridors through to the lowland*
- *Building materials: Combination of hard rocks from the north and sandstones from the south*
- *Historic features: Very rich in defensive sites, hill forts, castles and fortified manor houses*
- *Natural heritage features: Mainly confined to intervening valleys and gorges*

➤ *Other landscape features: No notable features*

viii. Landscape Designations and Policy

In regards to natural heritage sensitivity, SNH have produced guidance as to which areas in Scotland have most scope for wind turbine development, and which have the most significant constraints.²⁷ Three broad zones are identified:

Zone 1: Lowest natural heritage sensitivity (greatest opportunity for a large number of developments);

Zone 2: Medium natural heritage sensitivity (Some sensitivity, yet scope to accommodate development to an appropriate scale); and

Zone 3: High natural heritage sensitivity (Greatest constraint to development, some sites may be appropriate, yet full investigation into impact on natural heritage is likely to be required).

*The Corb is within the lowest sensitivity (Zone 1).²⁸ Zone 1 includes the 15% of Scotland's land area in which SNH considers that there is the greatest opportunity for development from a natural heritage standpoint. In general terms habitats, species and earth science interest within this area are of lowest sensitivity to wind farm development. Zone 1 encompasses many of the more managed landscapes and habitats modified by man, such as agricultural and commercially forested landscapes. Whilst cumulative impacts within this area are still important, it is appropriate for these areas in general to accept changes in landscape character in order to meet the needs of renewable energy generation. **It is important therefore to recognise that the inclusion of an area in Zone 1 does not imply absence of natural heritage interest. Good siting and design should however enable such localised interests to be respected, so that overall, within Zone 1, natural heritage interests do not present a significant constraint on wind farm development.***

²⁷ SNH (2009) *Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage: Policy Statement No. 02/02*: <http://www.snh.gov.uk/docs/A247182.pdf>

²⁸ SNH Map 5, Zones of Natural Heritage <http://www.snh.gov.uk/docs/C208975.pdf>

Eastern Area Local Plan (1998)

The proposed turbine site **does not** lie within any specific or determined policy areas as identified by the Perth & Kinross Local Development Plan and area maps. There are **no** National, Regional or Local landscape designations covering the proposed site.

The southern boundary of Cairngorm Partnership Area²⁹ is found approximately 7km to the north (POLICY 46); there is a Site of Special Scientific Interest (SSSI) located approximately 700m east of the development site (POLICY 12). The site has been located to mitigate for ecological concerns flagged, and all effects are covered fully in Chapter 7: Ecology, of the Environmental Report. There is a Scheduled Ancient Monument located approximately 800m northwest of the development site (POLICIES 20, 21, 22). Impacts and effects to and from this heritage site have been fully investigated and reported in Chapter 8: Cultural Heritage and Archaeology, of the Environmental Report.

➤ POLICY 2 (General Development):

- *All developments within the Plan area not identified as a specific policy, proposal or opportunity will also be judged against the following criteria:-*
- *Rural sites should have a landscape framework capable of absorbing or, if necessary, screening the development; 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 developments within the locality.*
- *The development should be compatible with its surroundings in land use terms and they should not result in significant environmental damage or loss to the amenity or character of the area.*
- *The road network should be capable of coping with traffic generated by the development and satisfactory access on to that network provided.*
- *Where applicable there should be sufficient spare capacity in drainage, water and education services to cater for new development.*
- *The site should be large enough to accommodate the development satisfactorily in site planning terms.*
- *Buildings and layouts for new development should be designed so as to be energy efficient.*

²⁹ Cairngorms National Park, <http://cairngorms.co.uk/>

- *Built development should, where possible, be built in those settlements which are the subject of inset maps.*
- POLICY 9 (Renewable Energy):
 - *The Council will encourage, in appropriate locations, developments which contribute towards the Scottish Renewables Obligation. In the absence of a detailed Council wide policy on renewable energy production, developments will be assessed against the following criteria:-*
 - *That provision can be made for construction traffic, without danger to road traffic safety or the environment.*
 - *That the development will not have a significant detrimental effect on sites of nature conservation or sites of archaeological interest.*
 - *That the development will not result in an unacceptable intrusion on the intrinsic landscape quality of the area.*
 - *That the development will not result in a loss of amenity to neighbouring occupiers by reasons of noise emission, visual dominance, electromagnetic disturbance or reflected light.*
 - *The cumulative impact of having two or more windfarms in the same area will be considered.*

The proposed transmission lines between the development and the National Grid will be considered an integral part of the development and their impact will also be assessed in relation to the above criteria. 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 46 (Cairngorm Partnership Area):
 - *The Council will work with the Cairngorms Partnership to secure the environmental, economic and social aims of the Partnership's Management Strategy.*
- Cairngorms National Park Plan (2007)³⁰:
 - **5.1.3 Sustainable Use of Resources:** *The special qualities that we value in the Park, together with the resources we use for much of our economy and communities, depend on the functioning natural systems which must be sustained. Many of the objectives set out in other sections of this plan will support effective management of these resources,*

³⁰ Cairngorms National Park, National Park Plan,
http://cairngorms.co.uk/resource/docs/publications/CNPA.Paper.301.National_Park_Plan_2007.pdf

but there are some objectives for sustainable resource use outlined here that should apply across all sectors. Strategic Objective for Sustainable Use of Resources:

- a) *All management and development in the Park should seek to make the most sustainable use of natural resources, including water and energy. All interests in the Park including households, land managers, visitors and businesses should seek to minimise their impact on natural resources and ensure their use is as sustainable as possible. New development and infrastructure should incorporate the most sustainable systems of energy, water, materials and other resources in order to minimise their impacts on natural processes.*

Energy

There is currently no significant energy generation within the National Park, although the water catchments in the Park provide energy to several hydro-electric installations in surrounding areas. Settlements currently draw their energy needs from the National Grid. In pursuit of more sustainable development, there is a significant opportunity in the Park to develop renewable sources of energy (including heat) such as biomass, wind, hydro, geothermal and solar to serve communities and households. Large-scale wind farms are not appropriate in the National Park due to landscape and natural heritage impacts, but the development of domestic, business and community-scale facilities in a full range of energy options should be pursued in appropriate locations.

The proposed development, given scale, distance and proximity to approved existing wind technology infrastructure and distance from the greater Cairngorms National Park boundary does not provide significant impact to the protected amenity of the Park.

- POLICY 47 (Historic Gardens and Designed Landscapes):
 - *The Council will protect and seek to enhance the Historic Gardens and Designed Landscapes identified on Proposals Map A and any others which may be identified by Historic Scotland and Scottish Natural Heritage during Plan period.*

The proposed development is sited approximately 8km north of the Designed Garden and Landscape of Craighall, Rattray. Due to the intimate, enclosed setting of the castle and grounds within the Ericht River gorge, along with the intervening topography of the rolling foothills, the distance between these sites ensures that there is no visual impact or detrimental effect on the protected designation. Craighall is a private garden and home, not open for public viewing.

- POLICY 48 (National Scenic Area):
 - *The Council will oppose developments which would have an adverse impact on the amenity of the National Scenic Area identified on Proposal Map A.*

The proposed development is situated 14km northeast of the River Tay National Scenic Area (NSA). Given the distance to the proposed turbine from the periphery of this NSA and the scale, form and diverse land use of the intervening landscape, the scale of the development would be very small, and if seen at all would be read as part of the existing Drumderg wind farm. There would be none to negligible adverse impact on this landscape amenity.

Proposed Local Development Plan (2012)

- POLICY HE1A and B (Scheduled Monuments and Non—Designated Archaeology):
 - *HE1A – Scheduled Monuments: There is a presumption against development which would have an adverse effect on the integrity of a Scheduled Monument and its setting, unless there are exceptional circumstances.*
 - *HE1B – Non-Designated Archaeology: The Council will seek to protect areas or sites of known archaeological interest 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 the granting of planning permission, will be required to make provision for the survey, excavation, recording and analysis of threatened features prior to development commencing. If discoveries are made during any development, work should be suspended, the local planning authority should be informed immediately and mitigation measures should be agreed.*

There is a designated Scheduled Ancient Monument (SAM) located 800m from the proposed turbine site. Full impact and effect of the proposed development on this site have been assessed in Chapter 8 of the Environmental Report, Cultural Heritage and Archaeology.

The important setting or integrity of this site within an evolved landscape that has seen the influence of human activity through deforestation, crofting, commercial reforestation, livestock grazing, estate management/heather control and more recently, large scale wind farming is not greatly affected by the addition or scale of this one further wind technology structure. There will be no physical impact to the footprint of this site.

- POLICY NE1B (National Designations):
 - *Development which would affect a National Scenic Area, Site of Special Scientific Interest or National Nature Reserve, will only be permitted where the Council as Planning Authority is satisfied that:*
 - (a) the proposed development will not adversely affect the integrity of the area or the qualities for which it has been designated; or*
 - (b) any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.*

As previously stated in analysis of the Local Development Plan policies, the proposed development is situated 16km northeast of the River Tay National Scenic Area (NSA). Given the distance to the proposed turbine from the periphery of this NSA and the scale, form and diverse land use of the intervening landscape, the scale of the development would be very small, and if seen at all would be read as part of the existing Drumderg wind farm. There would be none to negligible adverse impact on this landscape amenity.

➤ POLICY ER1A (Renewable and Low Carbon Energy Generation – 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 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.

Proposals for the development of renewable or low carbon sources of energy by a community may be supported where the development does not meet all of the above requirements provided it has been demonstrated that there will not be significant environmental effects and the only community significantly affected by the proposal is the community proposing and developing it.

The proposed development site, lying within the Highland Summits and Plateaux, and adjacent to the Highland Foothills Landscape Character Type is more readily absorbed into the scale of this landscape suitable for wind farm development.

Any significant adverse effects of the proposed single turbine development are negated by the presence of existing Drumderg Wind Farm. By carefully choosing a turbine of suitable typology, visual impacts are tied into the existing technology structure without expanding the footprint to a significant extent.

The proposed development, as a local individual project, will assist in meeting regional and national targets set for reducing carbon emissions; cumulatively with other suitably Council approved wind technology projects.

Electricity connectivity, transport infrastructure and access are all highly suitable for the scale of development.

As a diversification project in a rural location suitable for the scale and type of development, the local individual developer will be able to source income to the betterment of the local area from inward investment.

Within the constraints of the landowner/developer's property, the turbine location has been selected to address ecological concerns and to tie the turbine as closely from a visual standpoint to the existing wind technology development found in the landscape.

The main sensitive receptors affected by wind farm activity within this landscape are immediate localised residences. The developer of this single turbine project is such a local residential receptor, now directly benefitting from this type of private infrastructure development.

Supplementary Planning Guidance (SPG) for Wind Energy Proposals in Perth & Kinross (2005)

The proposed development site lies within a “**Broad Area of Search**” designation as identified in the SPG and Diagram 1 of the SPG.

Commercial and Community Wind Energy Schemes

7.3 The policy makes a distinction between two types of wind energy development which require different policy responses; community schemes and commercial schemes. The classification below is used within the following policy:-

Table1: Scale of Development

Type	Scale	Example
Community	Domestic	Single small turbine (typically up to 7m hub height, and blade diameter of 4m)
	Single	Single 'standard' turbine (typically more than 20m to hub height and blade diameter more than 20m)
	Cluster	2-5 turbines (typically no more than 30m from ground to blade tip) in a single installation
Commercial	Cluster	2-5 turbines (up to 120m from ground to blade tip) in a single

		<i>installation</i>
	<i>Wind Farm</i>	<i>6 or more turbines (up to 120m from ground to blade tip) in a single installation</i>

Scale of proposed development: Type - Community, Single.

➤ WIND ENERGY POLICY 1:

- *The Council will encourage the development of commercial wind energy schemes which assist in achieving the Scottish Executive's target of electricity generated from renewable sources by 2010 (sic.) and also community wind energy schemes to provide local electricity needs in locations least damaging to landscape character, amenity, habitats, and species in Perth & Kinross as shown in Diagram 1. In the period up to 2010 (sic.), the Council will look favourably on those schemes within the 'Broad Area of Search' which meet the criteria set out in the Council's Wind Energy Policy Guidelines. The Council will work, in conjunction with public agencies and the private sector, to ensure that Perth & Kinross makes an appropriate contribution to meeting the Scottish Executive's 40% (sic.) aspirational target of electricity generated from all renewable sources by 2020. The contribution to be made by Perth & Kinross to this target will be subject to a later review as wind energy schemes are implemented and other technologies come forward.*

➤ WIND ENERGY POLICY 2:

In the Broad Area of Search, Community and Commercial wind energy developments (see Table 1) 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, and are in locations least damaging to settlements, landscape character, visual amenity, habitats, and will not have unacceptable cumulative impacts.

- *POLICY GUIDELINE 1: Wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse impact which cannot be mitigated. A commercial or community wind farm or cluster is unlikely to be acceptable on prominent ridges, hills or sensitive skyline locations in or within 5km of any of the sensitive locations listed below unless it is demonstrated to the satisfaction of the Council that the impact will be slight or not significant.*

Design Measures

Effects on landscape character can be minimised by use of appropriate:

- *Siting in relation to other wind farms*

- *Selection of appropriate landscape*
- *Size of turbine*
- *Number of turbines*
- *Location of turbines in relation to landform and landscape characteristics*
- *Positioning of turbines in relation to other turbines*
- *Siting and design of tracks, borrow pits, buildings and any power lines*
- *Colours and finishes*
- *Reinstatement*

Evaluation

Effects on landscape character will be evaluated in accordance with current best practice.

Sensitive receptors:

- *National Scenic Areas*
- *National Parks*
- *Historic Gardens and Designed Landscapes*
- *Perth Green Belt*
- *Areas of Great Landscape Value*
- *The views from major tourist routes (M90, A826, A822, A827, A85, A9, B8019, B846) as shown on Diagram 1*
- *The views from popular public or representative viewpoints and paths as agreed with the Council*
- *Settlements*

Visualisations such as photomontages used to assist in the assessment of developments should use a full image size of A4 or A3 for a single frame picture, giving an image height of approximately 20cm to give a realistic impression.

- *POLICY GUIDELINE 2: Wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse visual impact which cannot be mitigated. 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, Scheduled Ancient Monuments, significant archaeological sites and their settings, Conservation Areas and Listed Buildings where no satisfactory assessment has been undertaken and where it has not been demonstrated, to the satisfaction of the Council, that the visual impact will be slight or not significant. Domestic-scale turbines will normally be acceptable beside existing buildings where visually and functionally related to and in proportion with them.*

Design Measures

Effects on landscape character can be minimised by use of appropriate:

- *Siting of the wind farm in relation to significant receptor locations*
- *Size of turbine*
- *Number of turbines*
- *Positioning of turbines in relation to sensitive receptors*
- *Positioning of turbines in relation to other turbines*
- *Siting and design of buildings and any power lines*

- *Colours and finishes*

Evaluation

It will be particularly important to assess the effects on:

- *Houses and settlements*
 - *The setting of locally prominent landforms which contribute to the character of the locality*
 - *The setting of locally prominent and/or valued buildings, including Listed Buildings, which contribute to the character of the locality*
 - *The setting of Scheduled Ancient Monuments and significant archaeological sites*
 - *The character and setting of the National Parks*
- *POLICY GUIDELINE 3: Wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse cumulative impact on important receptors. A commercial or community wind farm, cluster or turbine when located within 40km of another is unlikely to be acceptable where it has not been demonstrated, to the satisfaction of the Council, that the cumulative landscape and visual impact will be slight or not significant. The Council will encourage developers to co-operate over the exchange of information, where cumulative assessment has been identified as important and is needed in order to make such assessments.*

Design Measures

Impacts can be minimised by:

- *Positioning of the wind farm and turbines in relation to landscape character and surrounding landform and other wind farms*
- *Positioning of turbines in relation to other turbines and wind farms*
- *Siting and design of the wind farm in relation to power lines*
- *Colours and finishes*

Evaluation

It will be particularly important to assess the effects on:

- *The views from major tourist routes (M90, A826, A822, A827, A85, A9, B8019, B846) as shown on Diagram 1*
- *The views from popular public viewpoints*
- *Settlements*

The duration, frequency and nature of combined and sequential views (glimpses or more prolonged views; oblique, filtered or more direct views; time separation between sequential views) should be assessed.

ix. Landscape Impact

The following section considers the potential effect of the proposed turbine during its operation on the landscape amenity.

1. Landscape Character

TABLE 3.1: ASSESSMENT OF LANDSCAPE CHARACTER IMPACTS AND EFFECTS

Landscape Character	Sensitivity	Magnitude of Change (Impact)	Effect
Landscape Character Type (LCT): Highland Summits and Plateaux (3)	<i>Medium to High</i>	<p><i>Slight adverse impact:</i></p> <p>As defined in the Tayside Landscape Character Assessment document and evidenced through field work, this is a complex landscape with both glimpses of highland and lowland. Wind farming is evidenced in plateau areas of this LCT: when viewed, often only for short periods of time and interrupted by topography and mature vegetation cover. The proposed development, following national and regional wind farm locational guidance, ensures that impacts are kept low by siting physically adjacent to existing wind technology development ensuring that there is no confusion or cluttering of scale in keeping with the current setting. Many upland panoramas are not impacted by this development</p>	<i>Minor adverse</i>
Local Landscape (Mounth Highlands)	<i>Medium</i>	<p><i>Moderate adverse impact:</i></p> <p>The majority of higher impacts will be evidenced in the immediate environment of the turbine where it will be read as a moderately large man-made structure in a medium to large scale landscape which contains similar typology turbines. The physical</p>	<i>Minor to moderate adverse</i>

		impact of the proposed development is confined to a limited property boundary, though it will be viewed within the larger landscape from the Highlands areas.	
Landscape Designations	<i>High</i>	<p><i>No change to slight adverse impact:</i></p> <p>There are a significant number of Areas of Great Landscape Value (AGLV) and National Scenic Areas (NSA) within Perth & Kinross. The proposed project is not located in or immediately adjacent to an AGLV or NSA and lies within a Broad Area of Search for wind farm development which sees existing wind technology infrastructure. Any minor impacts that are experienced over distance from such designations are slight. No Historic Gardens and Designed Landscapes are impacted.</p>	<i>Neutral to minor adverse</i>
Local/Regional Policy & Guidance	<i>Medium-Low</i>	<p><i>Slight adverse impact:</i></p> <p>The proposed turbine site lies within a Broad Area of Search as designated by local Supplementary Planning Guidance for Wind Energy Proposals in Perth & Kinross (2005) and discussed in section v. Landscape Designations and Policy. In meeting design criteria and providing local benefit per policy and guidance, the impacts within this appropriate landscape can be classed as above.</p>	<i>Neutral to minor adverse</i>

Significance Criteria for Impact:

Substantial adverse impact: Where the scheme would cause a significant deterioration.

Moderate adverse impact: Where the scheme would cause a noticeable deterioration.

Slight adverse impact:	Where the scheme would cause a barely perceptible deterioration.
Slight beneficial impact:	Where the scheme would cause a barely perceptible improvement.
Moderate beneficial impact:	Where the scheme would cause a noticeable improvement.
Substantial beneficial impact:	Where the scheme would cause a significant improvement.
No change:	No discernible deterioration or improvement.

Significance Criteria for Effects:

Severe adverse effect:	The proposal would result in effects that are at a complete variance with the landform, scale and pattern of the landscape; would permanently degrade, diminish or destroy the integrity of valued characteristic features, elements and/or their setting; would cause a very high quality landscape to be permanently changed and its quality diminished.
Major adverse effect:	The proposal would result in effects that cannot be fully mitigated and may cumulatively amount to a severe adverse effect; are at a considerable variance to the landscape degrading the integrity of the landscape; will be substantially damaging to a high quality landscape.
Moderate adverse effect:	The proposal would be out of scale with the landscape or at odds with the local pattern and landform; will leave an adverse impact on a landscape of recognised quality.
Minor adverse effect:	The proposal would not quite fit into the landform and scale of the landscape; slightly affect an area of recognised landscape character.
Neutral effect:	The proposal would complement the scale, landform and pattern of the landscape; maintain existing landscape quality.
Minor beneficial effect:	The proposal has the potential to improve the landscape quality and character; fit in with the scale, landform and pattern of the landscape; enable the restoration of valued characteristic features partially lost through other land uses.
Moderate beneficial effect:	The proposal would have the potential to fit very well with the landscape character; improve the quality of the

landscape through removal of damage caused by the existing land uses.

2. Construction and Decommissioning Stages

During construction there will be a slight increase of construction activity including the presence of excavators, vans and one crane, with all work being carried out during weekdays and not at weekends. Works will be limited to removing a small area of semi-improved pasture farmland for construction crane pad and new track, existing laneways are to be retained and utilised, with improvement and stabilisation as necessary.

After the expected operational lifespan of the turbine (25 years), the turbine's structure, associated components including crane pad and any new track (unless required by the landowner) will be removed. This will result in a temporary increase in construction activity. The removal of the turbine will see the land where the turbine was situated returned to original agricultural use (potential livestock grazing). The operational impact will be reversible with no residual impact, resulting in a positive or neutral impact on the landscape after decommissioning.

3. Overall Landscape Impact

The predicted impact of the proposed turbine on the landscape character of the area is likely to be slight adverse impact, mostly localised, leading to a barely perceptible deterioration of the local landscape's resources and amenity.

There would be a minor adverse effect whereby the proposed scheme would slightly affect an area of recognised landscape character.

The turbine's visual impact would diminish further as the suitable landform reduces the prominence in the greater scale of the Landscape Character Type and area.

x. Visual Assessment

Visual impacts relate to the change of views and visual amenity for a number of receptors: Residents, (dwellings, settlements); travellers, (roads, rail, paths, cyclists); and visitors, (destinations, viewpoints).

TABLE 3.2: SENSITIVITY GRADING FOR VISUAL RECEPTORS

High	Residential buildings (key views); Main tourist sites and key recognised viewpoints and beauty spots; Users of important outdoor facilities inclusive of regionally and nationally designated trails, cycle networks and rights-of-way whose focus and attention is on the landscape; Key important landscape features (recognised physical/cultural/historic attributes and merit).
-------------	--

Medium	Residential buildings (secondary views); Road/rail/other transport routes travelling past or through the landscape.
Low	Users of outdoor facilities NOT focussed on the landscape; Commercial/business buildings and workers/commercially engaged pedestrians NOT focussed on the wider landscape.
Negligible	Views from heavily industrialised or other such impacted areas; Workers at their place of work; People absorbed in other such activities.

The extent of the visual impact from this turbine has been assessed through calculating the ZTV attached to the Appendix. The ZTV has identified a number of areas within the surrounding landscape where the turbine will be visible from.

As seen through the ZTV, due to the topography of the surrounding land, views of the proposed site will be limited largely to immediate local areas (predominantly in the 5-10km banding, fading out to 15/20km), while possibly being visible for northern most extreme receptors in Blairgowrie, located over 10km south of the subject site. There will be elevated views towards the turbine from the surrounding upland hills inclusive of the Mounth Highlands Landscape Character Area of the Highland Summits and Plateaux Landscape Character Type (3) and surrounding summits of the Highland Foothills.

As is illustrated by the topography of the area and highlighted by the ZTV, most roadway corridors and areas of concentrated settlement within valleys are screened by the landform. This includes the large section of the A93 running north from Blairgowrie approximately 2.7km west of the development site.

1. Predicted Visual Impact

Operational Stage

The following discussions are on the predicted visual impacts when the turbine is fully constructed, operational and viewed within the existing landscape. The viewpoints listed relate to the equivalent photomontages and wireframe diagrams in the Appendices.

Photomontage 1: From The Site Entrance on the Tullymurdoch and Alyth Local Road; Facing in a Northerly direction



FIGURE 3.1: PHOTOGRAPH OF EXISTING VIEW

Views are indicative of those experienced by vehicular road users and walkers on this open plateau form within a plateau moorland area of the Highlands Summits and Plateaux adjacent to the proposed development site. These take in the sparse moorland/semi and unimproved grazing land and undulations of the gentle whale-backed hills (running south and southeast into the Highlands Foothills) with larger, more dramatic surrounding Highlands viewed in the greater distance some 10-15km away. This is a modified landscape with larger scale wind farming evidenced to the southeast of the proposed turbine (Drumderg Wind Farm) and sporadic patches of commercial coniferous forestry found on the slopes and crests of the foothills.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be local road users with some tourist activity, and some upland walkers;

- The magnitude of impact: *Slight adverse impact* to existing views, resulting in *a barely perceptible to noticeable deterioration* to visual amenity from this vantage point;
- Overall degree of effects on visual amenity: *Minor adverse*, as the proposed scheme would slightly intrude on local visual receptors; slightly affect important visual amenity.

Photomontage 2: From Knock of Balmyle Hill (Hill of Persie); Facing in an Easterly direction



FIGURE 3.2: PHOTOGRAPH OF EXISTING VIEW

Views from hilltops and crests within the Mounth Highlands and Highland Foothills take in a quite varied array of visual stimuli. The landform provides interest with lower lying valleys containing patches of deciduous forestry along river and stream courses interspersed with improved and semi-improved grazing land, sporadic single and small groupings of established settlement. Plateaux areas of expansive heather and semi to unimproved grassland give way to large tracts of dark coniferous plantation forestry with felling operations evidenced on the whale-backed hills. The more dramatic forms of the Highlands provide the backdrop to many views to the north, east and west with more open carse evidenced to the far south. Large scale wind energy structures are evidenced in the open, undulating land form.

- The visual sensitivity of the visual receptor: *Medium-high* as the receptors will mainly be walkers within the foothills and greater highlands area;

- The magnitude of impact: *Slight adverse impact* to existing views, resulting in *a barely perceptible deterioration* to visual amenity from this vantage point. The proposed development would be visually read in the same context of the existing wind farm, without significantly increasing the extent of the physical footprint;
- Overall degree of effects on visual amenity: *Minor adverse*, as the proposed scheme would slightly intrude on local visual receptors; slightly affect important visual amenity.

Photomontage 3: From Creigh Hill by Backwater Reservoir; Facing in an Westerly direction



FIGURE 3.3: PHOTOGRAPH OF EXISTING VIEW

Views from this hilltop take in a wide panorama including the rolling and plateaux forms of the foothills with valleys and the whale-backed hills incorporating significant areas of dark coniferous plantation forestry contrasting against expansive areas of heather and semi to unimproved grassland. A wider view to the further dramatic Highland forms is evidenced. Large scale wind energy structures are viewed in the open, undulating land form, though from this degree of elevation they are not dramatically sky-lined, tending to be back dropped by the mountain forms beyond. Uninterrupted and un-impacted views of the dramatic Highlands are seen to the east through to the northwest.

- The visual sensitivity of the visual receptor: *Medium-high* as the receptors will mainly be walkers within the foothills and greater highlands area;

- The magnitude of impact: *Slight adverse impact* to existing views, resulting in a *barely perceptible deterioration* to visual amenity from this vantage point. The proposed development would be visually read in the same context of the existing wind farm (Drumderg), without significantly increasing the extent of the physical footprint and viewed over large forestry operations;
- Overall degree of effects on visual amenity: *Minor adverse*, as the proposed scheme would slightly intrude on local visual receptors; slightly affect important visual amenity.

Photomontage 4: From the B950 Pitlochry Road; Facing in an Southeast direction



FIGURE 3.4: PHOTOGRAPH OF EXISTING VIEW

Views along this scenic route take in the many varied forms of the Highland Summit and Plateaux, Highland Glens and Highland Foothills landscapes, following the undulating form of the valley between the A93 and Kirkmichael. This landscape includes agricultural activity in the valley bottom and extensive plantation forestry operations on the slopes and crests/summits of the lower lying foothills. The smaller scale landscape of the more enclosed valley often opens up to the medium scale of distant hills and the larger scale of more distant highland mountains. Large scale wind farm activity is evidenced when travelling in a southwest direction from Kirkmichael to the A93. From this section of roadway, the upper blade tips and occasional hub and blades of Drumderg Wind Farm are viewed above the distant crest of hill, seen above forestry clearance operations.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be local and tourist road users;
- The magnitude of impact: *No change to slight adverse impact* to existing views, resulting in *no discernible visual deterioration or improvement to a barely perceptible visual deterioration* to visual amenity from this vantage point. The proposed development would be visually read as part of the existing wind farm (Drumderg), without significantly increasing the existing impact or effect of this development;
- Overall degree of effects on visual amenity: *Neutral to minor adverse*, as the proposed scheme would maintain existing visual quality and at worst would slightly intrude on local visual receptors; slightly affect important visual amenity.

Photomontage 5: From the A93 at Glenshee Pottery³¹; Facing in an Southerly direction



FIGURE 3.5: PHOTOGRAPH OF EXISTING VIEW

Views along this scenic tourist route take in the many varied forms of the wider Landscape Character Types and Areas, passing through stages of valley corridors and allowing views of – and through – the Highland Foothills to the Highland Summits and Plateaux. The road is heavily undulating and winding in nature with distant views tending to be relatively short and often

³¹ Glenshee – Glen of the Fairies, Glenshee Pottery & Visitor Centre, <http://www.glenofthefairies.co.uk/Glenshee-Pottery-and-Visitor-Centre-g.asp>

interrupted by landform and valley vegetation. Views, for the most part, towards the existing Drumderg Wind Farm are screened from both directions by the topography and orientation. The valley side and elevation changes shield road users from the turbines. There are a couple of locations (heading north from Blairgowrie, approximately 4km southeast of Bridge of Cally and heading south at Lair) where the wind turbines of Drumderg are briefly evidenced in the greater landscape as extreme blade tip or sporadic hub and blade. Such views are very short and broken by mature roadway planting towards the south.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be local and tourist road users;
- The magnitude of impact: *No change to slight adverse impact* to existing views, resulting in *no discernible visual deterioration or improvement to a barely perceptible visual deterioration* to visual amenity from this vantage point. The proposed development would be visually read as part of the existing wind farm (Drumderg), without significantly increasing the existing impact or effect of this development;
- Overall degree of effects on visual amenity: *Neutral to minor adverse*, as the proposed scheme would maintain existing visual quality and at worst would slightly intrude on local visual receptors; slightly affect important visual amenity.

2. Tourist and Main Routes Sequential Impacts/Visual Receptors

TABLE 3.3: ASSESSMENT OF EFFECTS ON VISUAL RECEPTORS

Receptor	Sensitivity	Magnitude of Change (Impact)	Effect
Main Roads & Local Access Routes: A93 and B950	Medium	<i>Slight to moderate adverse impact:</i> As analysed and reported in the photomontage descriptions for the A93 (at Glenshee Pottery) and the B950, the setting of the single Corb turbine on the upland plateaux ensures that, like Drumderg Wind farm, any view of the turbine from the bottom of the valley corridors along these roads is short lived and broken in nature by the steep elevation changes of the valley sides and mature valley vegetation cover.	Minor adverse
Recognised Walking and National Cycling Routes: Highlands trails and summit walks; CATERAN Trail ³² ; No National Cycle Route section	High-Medium	<i>Slight adverse to moderate adverse impact:</i> Lower valley trails following valley corridors as above are not greatly impacted by the scale of this proposed single turbine development. It is understood that the majority of receptors affected by this development will be upland users, predominantly hill walkers/climbers. The large scale wind farm of Drumderg is evidenced from certain sections of the CATERAN Trail (a 104km circular route that straddles the border between Perthshire and Angus). The single proposed turbine at The Corb would be seen as part of this grouping when viewed in the larger context of the landscape from short sections of the southern trail (Alyth to Blairgowrie) at Burnside of Drimmie, approximately 3km east of Bridge of Cally.	Minor adverse
Tourist/Visitor Locations: Blairgowrie and	High to Medium	<i>No change:</i> As is evidenced by prepared desk-based study material (ZTV analysis) and extensive local field analysis, the picturesque country market towns	Moderate Neutral

³² Walking Highlands, The CATERAN Trail, <http://www.walkhighlands.co.uk/perthshire/cateran-trail.shtml>

Alyth		of Blairgowrie and Alyth are not impacted or see negative visual effect from the proposed development. This is due to distance and intervening foothills topography and extensive mature tree cover.	
-------	--	--	--

Significance Criteria for Visual Impact:

Substantial adverse impact:	Where the scheme would cause a significant visual deterioration.
Moderate adverse impact:	Where the scheme would cause a noticeable visual deterioration.
Slight adverse impact:	Where the scheme would cause a barely perceptible visual deterioration.
Slight beneficial impact:	Where the scheme would cause a barely perceptible visual improvement.
Moderate beneficial impact:	Where the scheme would cause a noticeable visual improvement.
Substantial beneficial impact:	Where the scheme would cause a significant visual improvement.
No change:	No discernible visual deterioration or improvement.

Significance Criteria for Visual Effects:

Severe adverse:	The proposed scheme would result in visual effects that are highly intrusive to visual receptors; would permanently degrade, diminish or destroy the integrity of valuable views; would cause important visual receptors to be permanently changed and the visual amenity severely diminished.
Major adverse:	The proposed scheme would result in visual effects that cannot be fully absorbed and may cumulatively amount to a significant adverse visual effect; are a considerable intrusion to visual receptors degrading the integrity of the receptor; will be substantially damaging to visual amenity.
Moderate adverse:	The proposed scheme would noticeably intrude on local visual receptors; will leave an adverse impact on the recognisably important visual amenity.

Minor adverse:	The proposed scheme would slightly intrude on local visual receptors; slightly affect important visual amenity.
Neutral:	The proposed scheme would visually complement the scale of the landscape; maintain existing visual quality.
Minor beneficial:	The proposed scheme has the potential to provide improvement on local visual amenity and receptors.
Moderate beneficial:	The proposed scheme has the potential to significantly provide improvement on important visual amenity and receptors.

3. Overall Visual Impact and Effect

The proposed turbine's setting within the landscape will have a slight adverse impact on the overall visual amenity, which would result in a minor adverse effect on visual amenity and receptors.

The introduction of a new man-made element into this Landscape Character Type will, of course, have a degree of impact varying from differing view corridors. The reduction of negative visual impacts to the greatest extent possible is achieved through measures including sensitively siting and scaling the turbine to fit within the wind farm evolved landscape appearing visually as part of the Drumderg development all in accordance with best practice guidelines set forth by Perth & Kinross' policies pertaining to wind technology development.

xi. Mitigation

The slender vertical form of the proposed turbine will mean it will be difficult to completely mitigate it against the surrounding landscape; though measures can be undertaken to help reduce the impact on the landscape and visual resources of the study area to the greatest extent possible. These measures have been considered at every stage of the proposed development from the initial design, operation and decommissioning to include:

- Choosing a turbine of suitable modern design and colour to best fit into the landscape and reduce reflective glare. Also to be in keeping with wider area turbines to prevent visual confusion by matching similar scale and type (visual tie-in to Drumderg Wind Farm);
- The transport route of the turbine will be carefully chosen so that it has a minimal impact on local users and the landscape. The smaller size of the single turbine does not require any amendment to the local roads layout. The roadway infrastructure has supported the development of large scale wind farming within the immediate locale;
- Construction of the access track and crane pad for the turbine will be an extension of the existing farm holding access track (which will be improved/stabilised) and retain existing field boundaries to minimise disruption to the area of land to be potentially grazed; and
- When the turbine is decommissioned all the turbine structures will be taken down, associated components removed and the ground will be covered with suitable topsoil and seeded with a suitable local grass seed mix, unless the landowner believes the new access track will be of beneficial use.

xii. Residual Impacts

The residual impact of the proposed development is likely to be medium-long term but reversible as the turbine will be in the landscape for a lifespan of only 25 years. At this stage, the turbine will then be decommissioned and the land returned to its previous agricultural use, unless the land owner wishes to retain the additional access track. Subsequently, any likely predicted impacts will then be reduced to *slight adverse* or none at this end life cycle stage of the turbine.

xiii. Do Nothing or Alternative Scenario:

This scenario assumes that there will be no change to existing land use it is likely that there is no change to the landscape and visual amenity.

However, if the current farming practice on the land ceased and the land becomes derelict or used for other uses, such as commercial forestry (seen extensively in this and surrounding Landscape Character Types), this could have a larger and potentially more long term negative effect on the local landscape compared to this proposed development through access, nutrient absorption and leaching, and resultant land scarring (again, seen in the area).

This proposed renewable energy development at The Corb is of a suitable size to sustain power for all farming activity at the farm and provide additional power for the National Grid (there is suitable connection capacity). It is not out of scale with the Local Landscape Type described above (Highland Summits and Plateaux/Highland Foothills/Highland Glens) as per Local Planning Policy and Supplemental Planning Policies pertaining to wind technology developments. The medium to long-term success of the farm can be established in the face of growing difficulties experienced by local upland and fringe livestock farmers. By securing management of this distinctive grazed landscape in the future, the overall visual appeal and rugged managed farm landscape of the area can be ensured and maintained in an area already suitably evolved for wind farm activity.

6. GEOLOGICAL, SOIL AND HYDROLOGICAL ASSESSMENT

An assessment of the potential effects on geology, hydrology and hydrogeology was carried out through a desk-based assessment and a site survey. Best practice legislation and guidance notes were consulted for conducting the hydrological assessment.

LOCAL SCOTTISH POLICY

GENERAL, NATIONAL AND LOCAL GUIDANCE:

- NPPG 7 planning and Flooding
- SEPA Policy no. 19: Groundwater protection policy for Scotland
- SEPA Pollution Prevention Guidance Notes (PPG):
 - PPG 1: General guide to the prevention of water pollution;
 - PPG 5: Works in, near of liable to affect watercourses;
 - PPG 6: Working at construction and demolition sites;
 - PPG 21: Pollution incident response planning;
- CIRIA Report C532: Control of Water pollution from Construction Sites.
- CIRIA Report C502: Environmental Good Practice on Site.

i. **Geology**

REGIONAL

The proposed site at The Corb is located in the northeast of the Midland Valley geology region. The Midland Valley of Scotland, lies between the Highland Boundary Fault and the Southern Upland Fault (Figure 2).

Some of the oldest rocks in the Midland Valley region date from the Ordovician period, around 470 million years ago. At that time northern Scotland lay at the southern edge of a continent known by geologists as Laurentia with the area that was to become the Midland Valley, forming a line of island volcanoes in the adjoining and gradually closing Iapetus Ocean. The Iapetus Ocean closed during Silurian times, in a continental collision known as the Caledonian Orogeny. This joined the crustal foundations of both Scotland and England.

Erosion of the mountains to the north and south, produced sand, silt and mud that was carried in to the Midland Valley area, covering the remains of the volcanic island chain. By Devonian and early Carboniferous times, Scotland lay just south of the equator. The climate was hot and dry, with seasonal rains. Rivers laid down 'The Old Red Sandstone' and volcanic activity gave rise to extensive lava fields.

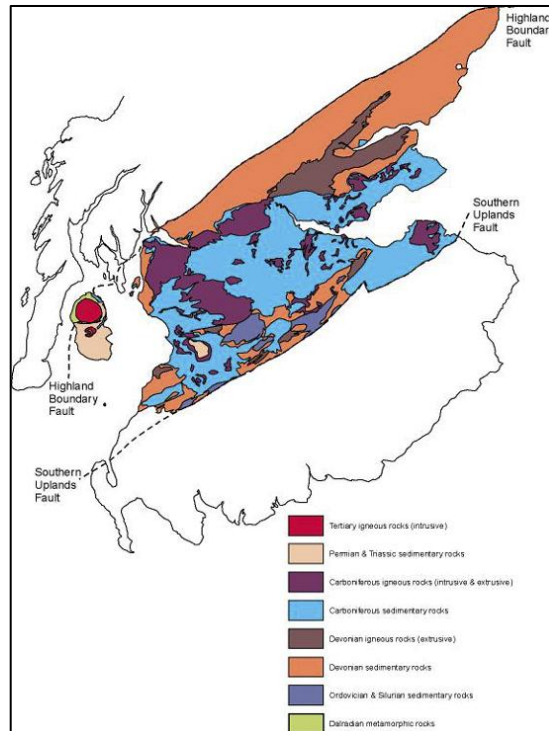


FIGURE 3: MIDLAND VALLEY GEOLOGICAL MAP³³

This area contains a wide variety of lowland glacial landforms and deposits, coastal landforms and deposits and active river landforms.

The effects of glacial erosion in this area are more subtle than in the Highlands. Pre-existing valleys were over-deepened but later infilled with drift, and the hills moulded and streamlined by the passage of the ice. Striking examples of such moulding are represented in the crag and tail forms and streamlined bedrock of Midlothian and East Lothian. The northern mountains of Arran display many classic landforms of mountain glacial erosion.

The lower ground is mostly covered by a cover of drift deposits, comprising of till and sand and gravel, from the last and earlier ice sheets. These deposits have a range of surface forms, including, eskers, kames and outwash terraces. Notable examples include the drumlin field of the Glasgow area and the nationally important Carstairs Kames.

The Loch Lomond area provides evidence for the final episode of glaciation at the end of the ice age. This is known as the Loch Lomond Readvance, a glacial event which occurred between about 12,600 and 11,500 years ago.

A distinctive aspect of the coastal scenery in the west is the pronounced shore platform and its associated cliff line, part of the Main Rock Platform. The western Forth Valley has one of the most important records of relative sea-level change in Scotland. Here a sequence of buried beaches and carse deposits provide a record of changes during the last 12,000 years. The coastal

³³ http://www.scottishgeology.com/geology/regional_geology/geo_maps/midlands_map.html

lowlands of Angus, Fife and East Lothian provide widespread evidence of sea level changes, in the form of raised shorelines and the extensive development of carselands.³⁴

ii. Soils

REGIONAL

The Central Lowlands extend across Scotland with the Grampian Mountains to the north, fringed by the Highland Boundary Fault stretching between Stonehaven and Helensburgh and the hills of the Southern Uplands to the south separated by the Southern Uplands Fault. Whereas the greater part of the region lies below about 175 metres many areas exceed 300 metres and the highest parts reach to nearly 600 metres culminating within isolated peaks within the Campsie and Ochil Hills.

The regional relief has been determined basically by differential erosion of the rock types with the resistant igneous rocks forming hill masses and the softer sedimentary rocks form broad, undulating plains with major river valleys. The landscape has been modified, however, by the effects of three different phases of glaciation followed by oscillations in relative land and sea levels and these have resulted in the formation of different soil parent materials ranging from glacial till deposits to late and post-glacial raised beaches with sands, gravels, silts and clays all present. Within the hill areas, drift and shallow drift deposits are widespread, the latter associated with zones of outcropping rock.

Simplified landforms of the eastern Central Lowlands - deep brown forest soils are widespread on the till plain with imperfectly draining variants and gleys in the intervening hollows. Podzols, including peaty podzols, characterise the hill areas with rankers and lithosols associated with areas of rock outcrop.

Simplified landforms of the western Central Lowlands Mixed glacial tills, often with relatively fine textures, are widespread with a high proportion of surface-water gley soils. Brown forest soils are restricted to the highest ground and peat mosses occupy the larger hollows.

³⁴ http://www.scottishgeology.com/geology/regional_geology/midland_valley.html

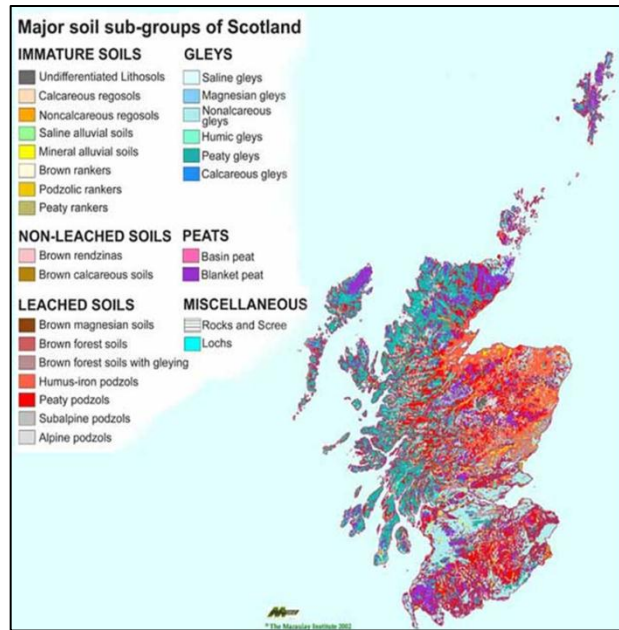


FIGURE 4: MAJOR SOIL SUB-GROUPS OF SCOTLAND³⁵

LANDUSE¹⁴

Human influence on the vegetation of the Central Lowlands has been profound. A good example is the widespread planting of plantation woodland, both coniferous (for commercial forestry) and deciduous (in estates). Grasses, herbs and rushes have invaded former mining and industrial areas between Edinburgh and Glasgow as these industries disappeared.

Apart from agriculture and forestry, the main land use in the Central Belt is urban and industrial. The conurbations of Edinburgh and Glasgow accommodate a large proportion of the Scottish population. The legacy of land use for mining and other industry is evident to anyone travelling between the two cities and has completely transformed the nature of the landscape. But aside from the visual element, what effect has this had on the soils in the area? In terms of mining and other extraction industries, the soil is often regarded as a hindrance to be removed in order to get at the valuable resource under the surface. Towns, buildings and roads are often located on the best quality soils in a given area. This is because the soils are usually associated with other environmental factors like good drainage, a flat surface for building, and shelter. The soils are effectively rendered unusable and even if they are re-exposed at some time in the future, their characteristics will have been drastically altered. In the past, there were far fewer controls than now on the environmental impacts of development and on disposal of waste materials – the consequences of this are obvious in many parts of the region.

In recent years legislation has been greatly improved to protect land. And there is a growing interest in the reclamation and restoration of derelict areas. Areas can be reclaimed by importing topsoil and spreading it over the land surface. However, this can be a very expensive operation. Often a more practical solution is to use the existing material and establish vegetation that can adapt to the conditions. Over time, the soil quality can improve. Derelict land is often

³⁵ Macaulay Land Use Research Institute, Soil Distribution, <http://www.macaulay.ac.uk/explorescotland/soildist1.html>

deficient in nitrogen, an essential plant nutrient. Legumes – plants which can take up nitrogen directly from the atmosphere – are very useful in these situations. The nitrogen is released into the soil when the plant dies and decays. Some other plants are tolerant to high concentrations of certain metals, and others still of very acid conditions. The rate of improvement may be increased by adding organic waste by-products, including animal slurry, sewage sludge and other recycled organic wastes. Many of the large number of coal and oil shale bings in, for example, the area around Hamilton and Motherwell, have been successfully reclaimed in this way. The restored land is put to a variety of uses.³⁶

Agriculture is widespread but with considerable human influence. There has also been extensive planting of plantation woodland, both coniferous (for commercial forestry) and deciduous (for amenity planting). Widespread industrial use and urban development have altered the landscape; the vast conurbation of Glasgow and its satellite towns are intermingled with industrial sites. Previous mining, both coal and oil shale, has also left an impact with derelict land and reinstated land a direct legacy of such development. Recent interest in reclamation and restoration has addressed such industrial development.

SOIL CHARACTERISTICS OF THE SITE

The soil types within the development area consist of cultivated soils: Fungarth series belongs to the brown earths major soil subgroup. It is a well-drained soil with bright colours and mineral topsoil.³⁷

It is perceived that the local surface and groundwater hydrology will remain unaffected by the proposed development as the development should not impact upon any burns or rivers or additional hydro features such as drainage systems. The Drumturn Burn is located circa 250m from the proposed turbine. As a result, the Drumturn Burn is located a sufficient distance from the proposed site so as not to be affected by the development. The landscape appears to slope downward gently towards the west, so the surface run-off and subsurface hydrology should remain uninterrupted. All drains and burns will be avoided where necessary, and drains will be monitored to ensure they remain unblocked during the construction phase of the development. However, it remains unlikely that the development will have an impact on the hydrology and soil drainage in the area surrounding the turbine.

iii. Hydrology

HYDROLOGICAL CHARACTERISTICS OF THE SITE

At the proposed turbine site, the land appears to have good drainage as indicated by the soil characteristic description by the Macaulay Institute. The site area consists of brown earth that is brightly coloured, and has mineral topsoil. The main hydrological feature within the vicinity of the site is that of Drumturn burn, situated approximately 250m north of the proposed turbine

³⁶ <http://www.snh.org.uk/publications/on-line/livinglandscapes/soils/soillandscapes.asp>

³⁷ The Macaulay Land Use Research Institute, Soil Indicators For Scottish Soils, http://sifss.macaulay.ac.uk/SSKIB_Stats.php

location. It is perceived that the wind turbine development will have no significant impact on Drumturn burn due to its proximity away from the site. Drainage systems should not be impacted significantly upon, due in part to the developments scale and its siting in relation to drainage systems.

SURFACE AND GROUND WATER HYDROLOGY

Understanding surface and groundwater environments is critically important to designing a successful project. Surface water includes watercourses, water bodies and runoff. Groundwater includes all water stored in permeable underground strata (or aquifers). In any construction project, it is important to understand where and how these relate to each other, so that the project can be designed to minimise the risk of pollution or any other potential impacts. Surface water provides important water resources for potable and other supply; amenity; aesthetic value; conservation and ecological environments; and importantly, recharges the ground water systems. Key pollution concerns for surface water from a project like this are: sediment erosion and contained silt; chemical spill from activities such as refuelling; contaminated ground water from any dewatering activities; and modifications or destruction of habitats.

At this site there will be no risk to the surface or ground water hydrology as mitigation measures will be taken to ensure there is no contamination.

During the construction phase of the turbine, there is potential for hydrological impacts on the groundwater. Roads, foundations, cable trenching and other construction works associated with wind turbines can disrupt groundwater flow and impact on the hydrological cycle and groundwater dependent terrestrial ecosystems. However, due to the nature of the groundwater system at the location proposed here, there will be no hydrological impacts.

Hydrology and the potential effects of drainage from turbine, access tracks and other ancillary development should be considered, as there could be significant effects on or adjacent to the application site. Watercourses, underground streams and private springs should be avoided, and private water supplies should not be adversely affected.

There will be no abstraction of water required for the development which could impact water supplies or ecological systems.

SEPA FLOODRISK

The site location is situated at a height of 384m OD, in an area deemed not flood risk area by SEPA. This is defined as areas at risk of flooding from rivers, the sea, or from both rivers and the sea. There is an area of flood risk surrounding Drumturn Burn but due to its location circa 250m from the flood zone it can be stated that there is no risk of flooding at the proposed site. As a result, this will considerably reduce potential impacts on hydrology in the vicinity of the development; especially during the construction phase of the development.

7. ECOLOGY

i. Methodology

In compliance with ‘Assessing the impact of small-scale wind energy proposals on the natural heritage, February 2012’³⁸ a site assessment has been undertaken, the results of which will be attached as an appendix to this document. Digital datasets from Scottish Natural Heritage (SNH) will be consulted to identify the designated environmental sites within the region and to analyse if these will be impacted by the proposed development.

a. Main Policy and Guidance³⁹

SNH recognises that birds and bats are the main classes of fauna perceived to be potentially vulnerable to wind energy developments, through collision with turbine blades. The relevant policy and guidance to wind turbine developments such as the one proposed here therefore centres on the protection of these. Nevertheless, other protected habitats and species must also be taken into consideration, such as the potential for disturbance posed to Badgers, which are protected by the Protection of Badgers Act 1992.

Birds

The EU Birds Directive (2009/147/EC) creates a comprehensive scheme of protection for all wild bird species naturally occurring in the EU. Initially established in 1979, the directive recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It is also recognised that wild birds (many of which are migratory) are a shared heritage of the Member States and that their effective conservation required international co-operation throughout the EU.

Great emphasis is placed on the protection of habitats for endangered or migratory species (listed in Annex I) through the establishment of a coherent network of Special Protection Areas (SPAs). Since 1994, all SPAs form an integral part of the EU wide NATURA 2000 ecological network.

The 1981 Wildlife and Countryside Act {amended by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2011} prevents the intentional or reckless disturbance of wild birds, their nests and eggs, (in addition to protecting other animal species, plants and habitat types).

Bats

Natural England have produced best practice guidance documents, which suggest that wind turbines be situated in positions where their blade tips are at least 50m from hedges, tree-lines or woodland areas, and water bodies.

³⁸ <http://www.snh.gov.uk/docs/A669283.pdf>

³⁹ <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/>

Protected habitats

The 1992 Habitats Directive (92/43/EEC) affords protection to certain habitats and species identified in the Directive, including those requiring strict protection (European protected species). These areas are known as Special Areas of Conservation (SAC). The Habitats Directive combines with the Birds Directive to form the foundation of Europe's nature conservation policy – the Natura 2000 network. This protects over 1,000 animal and plant species, in addition to 200 'habitat types,' such as special types of forests or wetlands that are of European importance.

The aim of the network is to assure the long-term survival of Europe's most valuable and threatened habitats and species. The Natura 2000 network is not a collection of explicitly nature only preserves - where all human activities are forbidden. The network will certainly include land likely to be privately owned. The emphasis in this case will be on ensuring that future management is sustainable, both economically as well as ecologically. The establishment of this network of protected areas also fulfils a member state obligation under the UN Convention on Biological Diversity.

In order to comply with the legislation outlined, this assessment aims to determine whether any adverse impact is likely to be caused to protected species and areas through the proposed wind turbine development.

b. Designated Environmental Sites

The legislation described above has led to the formation of the following protected areas of nature conservation:

Sites of Special Scientific Interest (SSSI)	Areas of land that represent a wide range of natural features, from vulnerable plants or animals, to high-quality habitat examples, such as wetlands or meadows. Legally protected through a number of Acts including the Wildlife and Countryside Act 1981.
Special Protection Areas (SPA)	European designated sites, protected under the Wild Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) [previously Directive 79/409/EEC]. These sites have been identified as being of international importance to rare or vulnerable bird species.
Special Areas of Conservation (SAC)	European designated sites, protected under the 1992 Habitats Directive (92/43/EEC) are intended to form a European Community-wide network of protected areas (Natura 2000) for those habitats and species which are endangered, vulnerable, rare, or otherwise require special attention.
Royal Society for the Protection of Birds (RSPB) Reserves	Maintain a number of reserves in places ranging from cliffs to urban areas for birds and other wildlife

Additional sites are also taken into consideration, including: Ramsar sites - wetlands of international importance designated under the Ramsar Convention; National and Local Nature Reserves (NNRs and LNRs) - important sites for wildlife, geology, education or public enjoyment; National Parks; and Country Parks. A map containing all designated environmental sites within a 20km study zone has been produced (see Appendix). Within 20km there are several SPAs, SACs,

SSSIs, National Nature Reserves, RSPB Reserves and the Cairngorms National Park, located circa 7km north of the proposed turbine.

These designated environmental sites are identified by SNH as important habitats to consider with a medium-scale wind turbine planning application and shall therefore be the focus of this assessment.

ii. Designated Environmental Sites near to The Corb

a. Special Protection Areas within 20km

TABLE 3: SPAS WITHIN 20KM

Site No.	Site Name	Category	Feature	Distance (~km)
8503	Forest of Clunie	Birds – Aggregation of breeding birds	Hen Harrier (<i>Circus cyaneus</i>), Merlin (<i>Falco columbarius</i>), Osprey (<i>Pandolion haliaetus</i>), Short-eared Owl (<i>Asio flammeus</i>)	7.7
8535	Loch of Lintrathen	Birds – Aggregations of non-breeding birds	Greylag Goose (<i>Anser anser</i>)	10.6
10234	Cairngorms Massif	Birds – Aggregation of breeding birds	Golden Eagle (<i>Aquila chrysaetos</i>)	15
8534	Loch of Kinnordy	Birds – Aggregations of non-breeding birds	Greylag Goose (<i>Anser anser</i>), Pink-footed goose (<i>Anser brachyrhynchus</i>)	18.8

Description:

1. Forest of Clunie⁴⁰

Extending north from the Dunkeld - Blairgowrie Road to the southern slopes of Ben Vrackie in the northwest and Spittal of Glenshee in the northeast. The area is covered mainly by heather moorland and grassland, with scattered, small stands of woodland, two areas of recent native pinewood plantation and several small lochs.

Forest of Clunie SPA qualifies under **Article 4.1** by regularly supporting breeding populations of European importance of the Annex 1 species Hen Harrier *Circus cyaneus* (average of 20 breeding females between 1994 and 1998, 4% of GB), Osprey *Pandion haliaetus* (average of 6 pairs

⁴⁰ Forest of Clunie; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8503

between 1994 and 1998, 6% of GB), Short-eared Owl *Asio flammeus* (15 pairs in 1998, 2% of GB), and Merlin *Falco columbarius* (12 pairs in 1998, 0.9% of GB). The Hen Harrier population on this site is one of the largest and densest in Britain. The Osprey population on this site is one of the largest in the British SPA network. Both Short-eared Owl and Merlin are very widely dispersed across their British distributions and the Forest of Clunie is one of very few sites to support significant numbers.

2. Loch of Lintrathen⁴¹

The site qualifies under **Article 4.2** by regularly supporting, in winter, internationally important numbers of the Icelandic population of greylag geese *Anser anser*. In the five-winter period 1985/86 to 1989/90 an average peak of 2,100 birds was recorded, representing 2% of the total population, all of which winters in Britain.

Loch of Lintrathen is also of importance for its assemblage of wintering birds typical of open water and associated wetlands. These include: whooper swan *Cygnus cygnus cygnus* (an Annex I species), wigeon *Anas penelope*, teal *Anas crecca*, mallard *Anas platyrhynchos*, and goosander *Mergus merganser*.

3. Cairngorms Massif⁴²

The Cairngorms Massif Special Protection Area (SPA) is a large, upland site in the north east Highlands. The boundary of the SPA incorporates the majority of the Cairngorm Massif and the higher hills and mountains stretching to the west and south to the Dalnamein Forest, Beinn a' Ghlo, and Ben Vrackie in Perthshire; to the east to Caenlochan, Lochnagar, and the heads of the Angus Glens as far as Mount Keen and Glen Tanar in Grampian; and from upper Deeside north to Abernethy.

The site rises from 270m to over 1300m and encompasses a diverse range of habitats including heather moorland/grouse moor, grassland, blanket bog, native woodland, freshwater lochs and lochans, extensive areas of montane heaths and exposed rock and scree. Many of these habitats are recognised at a European level and the SPA overlaps Beinn a' Ghlo, Caenlochan, Cairngorms, Ballochbuie, Coyles of Muick SACs along with the upper tributaries of the River Dee, River South Esk, River Tay and River Spey riverine SACs. The SPA overlays all or parts of Abernethy Forest, Cairngorms, Forest of Clunie, Ballochbuie, Glen Tanar, Caenlochan and Lochnagar SPAs.

The Cairngorms Massif SPA qualifies under **Article 4.1** by regularly supporting a breeding population of European importance of the Annex 1 species golden eagle *Aquila chrysaetos* (26 active territories in 2003, representing approximately 5.8 % of the GB population).

⁴¹ Loch of Lintrathen; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8535

⁴² Cairngorms Massif; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=10234

4. Loch of Kinnordy⁴³

The Loch of Kinnordy SPA is an eutrophic loch with associated wet meadows and marshes in Angus, Scotland. The site is of international importance for its wintering and breeding birds. Its boundary is coincident with that of the Loch of Kinnordy SSSI.

The site qualifies under **Article 4.2** of the EC Wild Birds Directive by regularly supporting internationally important wintering numbers of the Iceland population of greylag geese *Anser anser* and the Icelandic/Greenlandic population of pink-footed goose *Anser brachyrhynchus*. During the five-winter period 1986/87 to 1990/91 average peak counts of 910 greylag geese, and 3,960 pink-footed geese were recorded, representing 1% and 3% of the respective international populations.

Also notable under **Article 4.2** are nationally important breeding populations of five migratory species: 4 pairs of black-necked grebe *Podiceps nigricollis* (15% of the British population); 7 pairs of Gadwall *Anas strepera* (1% of British); 19 pairs of shoveler *Anas clypeata* (1% of British); 7 pairs of pochard *Aythya ferina* (2% of British); and 7,000 pairs of black-headed gull *Larus ridibundus* (3% of British).

The site is additionally important for its assemblage of wintering waterfowl typical of open water and associated wetlands. These include wigeon *Anas penelope*; teal *Anas crecca*; mallard *Anas platyrhynchos*, tufted duck *Aythya fuligula*; goldeneye *Bucephala clangula*; and goosander *Mergus merganser*.

TABLE 4: connectivity with SPAs⁴⁴

Protected Area Name	Qualifying interests	Maximum range	Is the application within the range for any of the qualifying interests?
Forest of Clunie	Hen Harrier	2-3km	No
"	Osprey	10km	No
"	Short-eared owl	2km	No
"	Merlin	5km	No
Loch of Lintrathen	Greylag goose	15-20km	Yes
Cairngorms Massif	Golden eagle	2-3km	No

⁴³ Loch of Kinnordy; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8534

⁴⁴ Connectivity of SPAs; <http://www.snh.gov.uk/docs/A675474.pdf>

Protected Area Name	Qualifying interests	Maximum range	Is the application within the range for any of the qualifying interests?
Loch of Kinnordy	Greylag goose	15-20km	Yes
"	Pink-footed goose	15-20km	Yes

b. Special Areas of Conservation within 5km

TABLE 5: SACs WITHIN 5KM

Site No.	Site Name	Category	Feature	Distance (~km)
8244	Dun Moss and Forest of Alyth mires	Bogs (Wetland)	Active raised bog	0.7
8366	River Tay	Fish; Mammals; standing open water and canal	Brook lamprey (<i>Lampetra planeri</i>); Sea lamprey (<i>Petromyzon marinus</i>); Atlantic salmon (<i>Salmo salar</i>); River lamprey (<i>Lampetra fluviatilis</i>); Otter (<i>Lutra lutra</i>); Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	2.5

c. Sites of Special Scientific Interest within 2km

TABLE 6: SSSIs WITHIN 2KM

Site No.	Site Name	Category	Feature	Distance (~km)
649	Forest of Alyth Mires	Bogs (Wetland)	Raised Bog	0.7
555	Dun Moss	Bogs (Upland)	Saddle mire	0.7

Description:

1. Forest of Alyth Mires⁴⁵

The Forest of Alyth Mires lie 7 miles due north of Blairgowrie. Formed in the undulating hill ground of the Forest of Alyth, this site consists of a complex of raised and intermediate bogs with associated marginal fen, habitats which are very rare in Great Britain.

This site is considered to be a nationally important peatland because it has an unusually extensive series of confined upland raised bogs. Two of the raised bogs are particularly

⁴⁵ Forest of Alyth Mires; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=649

undisturbed and vegetation here includes some uncommon bog mosses. The poor-fen bounding the raised bogs is especially extensive.

Dwarf birch *Betula nana*, a nationally scarce species, occurs in one of the bogs. This species is on the southern and eastern extremity of its range in Scotland and at a comparatively low altitude. The moss species are locally scarce and characteristic of relatively undisturbed bogs.

With the two bogs at the neighbouring Dun Moss, the two sites together form the only series of raised bogs in Eastern Perth & Kinross.

2. Dun Moss⁴⁶

Dun Moss lies 10 kilometres due north of Blairgowrie amid the gently rolling hills of the Forest of Alyth. It is an example of an upland saddle raised bog, a type that is extremely rare in Great Britain.

The bog system is intact and still shows a distinct nutrient-poor fen lagg around its margin. The bog surface is raised, and receives its water exclusively in the form of rain and snow fall. The wet heath vegetation on Dun Moss is unusual, rich in lichens, and includes a number of uncommon species of bog moss *Sphagnum* species. A second small raised bog occurs on a “bench” in the slope in eastern part of the site.

The site is contiguous with Forest of Alyth Mires SSSI, which is a unusually extensive series of confined upland raised bogs. The two sites can be considered to be part of the same series of bogs (the only such series of bogs in Eastern Perth & Kinross).

Habitat description

Using satellite imagery and a site visit, the site can be described as ‘Neutral Grassland’ as per Phase 1 Habitat Survey guidance⁴⁷. Neutral grassland is described as ‘typically enclosed and usually more intensively managed than acid or calcareous grassland (except on roadside verges), this category encompasses a wide range of communities occurring on neutral soils (pH 5.5-7.0).

iii. Potential Impacts

It is determined that one medium sized turbine will not have a significant impact upon local flora and fauna as the turbine is not located within a designated site, and has been sited in accordance with ecological concerns flagged by the Council: therefore the construction of the foundations, access track, cable trench and other ancillary works should not pose a threat to any protected species of flora or fauna. Birds and bats are the most likely animal species to suffer fatalities from turbines through direct collisions and are subsequently important to a wind turbine Planning Application. Drumderg Windfarm is also located within the vicinity of this landscape, and has posed no threat to the local flora and fauna.

⁴⁶ Dunn Moss; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=555

⁴⁷ JNCC Guidance; http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf

The closest SPA is located 7.7km west of the proposed turbine location, and is designated for species such as the Hen Harrier. The turbine is out-with the core foraging range for the following species: Hen Harrier, Osprey, Short-eared owl and Merlin. The turbine is within the core foraging range for Pink-footed geese and Greylag geese.

Due to the distance of the turbine from the SPAs listed above, it is perceived that there will be little to no impact on the protected species.

It has to be noted that displacement and barrier movement is not likely to have a significant effect on the species as it is a single turbine development.

iv. Mitigation Measures

This development will only consist of one medium sized turbine. Through careful desk based and field studies it has been determined that the erection of the turbine will not have any real significant effect on the local and regional ecology, lying outside of any designated environmental site. The turbine has been moved from its original screening location in order to avoid any potential impacts upon Dun Moss and Forest of Alyth mires SAC. This location has been confirmed as having no potential impact upon the SAC as the relief of the land ensures drainage from the development is away from the protected site.

All relevant necessary surveys are being carried out as requested from the initial ecological appraisal (see Appendix C).

Bats

Following best practice guidance referred to by SNH and produced by Natural England on bats (TIN051), the turbine has been sited at least 50m away from any linear features such as trees, walls, hedges, buildings and water bodies; so as to ensure there will be no impact on bat populations that could utilise the area.

The Joint Nature Conservation Committee (JNCC) has identified through their research that a bat survey should normally be recommended for turbines located within 50m of buildings, structures, woodland, hedgerows, rivers or lakes, or within sites designed for bats (SSSIs or SACs).⁴⁸ Since this turbine will be located in open farmland away from any structures or woodland, this should not be an issue and bat surveys will not be required.

⁴⁸ Natural England, www.naturalengland.org.uk

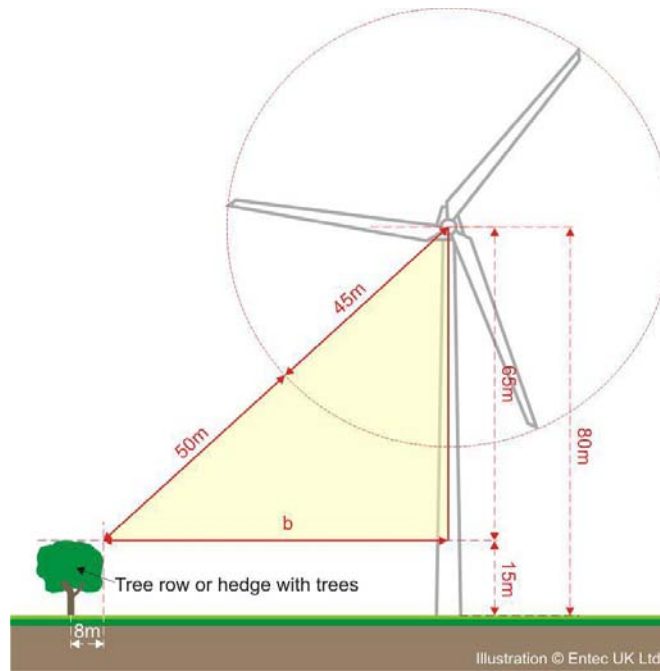


FIGURE 5: TURBINE DISTANCE ADVICE FOR BATS⁴⁹

PLEASE NOTE THAT THIS DIAGRAM IS NOT REPRESENTATIVE OF THIS PROJECT

The majority of bat species are also known to use echolocation calls which are only useful within a couple of metres. Therefore they tend to fly closer to habitats such as hedgerows, woodlands, walls, rivers, and within tree canopies. These species are less likely to collide with a turbine. Natural England research also suggests that the further away the turbine is positioned from linear habitats, the larger the decline in activity.

Good practice measures will be taken where necessary including:

- Site Selection (to reduce impacts on wildlife);
- Locating turbines so that their blade tips are at least 50m from hedges, tree-lines or woodland in the vicinity;
- If there are roosts within the vicinity of the proposed turbine, turbines will be positioned as far away as possible from the roosts and from any flight paths.

⁴⁹ SNH, <http://www.snh.gov.uk/docs/C245244.pdf>

8. CULTURAL HERITAGE AND ARCHAEOLOGY

i. Background

Our whole environment has been shaped by 10,000 years of human activity and as such has a historic dimension that is dynamic; frequently adapting to meet changing needs. The importance of protecting this historic environment – a term which encompasses ancient monuments, archaeological sites and landscapes, historic buildings, townscapes, parks, gardens and designed landscapes, and our marine heritage – is widely recognised, however this protection is not about preventing change.⁵⁰

Modern wind energy, which has been developed partly to address climate change issues, can both threaten the historical landscape if sited inappropriately, and work towards protecting it in the long-term. This is because the threat of changing weather patterns from climate change, (higher winds, increased rain and other indirect effects), has been recognised as a significant risk to the fabric of the historic built environment.⁵¹ Wind energy therefore has a positive role to play in regards to our cultural heritage and archaeology.

Land use change through human activity is often perceived to be negative, and yet values shift over time as the landscape evolves. Wind energy has been used since at least the 17th century to power industry, (milling, pumping and sawing), and windmills are now seen to add positively to the character of the landscape. One well preserved example of a windmill tower is located at the Glenugie Distillery in Aberdeenshire (Canmore ID: 21335).⁵²

ii. Methodology

A thorough assessment of the cultural heritage and archaeology local to The Corb has been conducted to determine the potential impacts of the proposed turbine development. The aim of this investigation is to identify the direct and indirect impacts of the turbine, cable trench, access road and other infrastructural requirements within a targeted study area around the development.

This assessment is conducted via a desk-based assessment of Historic Environment Records (HERs) using a variety of resources; in addition to a field inspection to ascertain the actual conditions on the ground and if there are any unrecorded archaeological features.

a. Policy and Guidance

National planning policy and guidance aims to protect, conserve and enhance the historical environment. A number of policy and guidance documents, some geared towards proposed

⁵⁰ Historic Scotland 'Scottish Historic Environmental Policy' July 2009

⁵¹ Scottish Planning Policy (SPP) 23: Planning and the Historic Environment, 2008

⁵² 'Peterhead, Glenugie Distillery, Windmill Tower'
<http://canmore.rcahms.gov.uk/en/site/21335/details/peterhead+glenugie+distillery+windmill+tower/>

renewable energy development in particular, indicate how the planning system will achieve this. These documents include:

- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- Ancient Monuments and Archaeological Areas Act 1979;
- Town and Country Planning (Scotland) Act 1997
- Planning etc. (Scotland) Act 2006;
- Scottish Planning Policy 23 Planning and the Historic Environment 2008;
- Historic Scotland, Scottish Environmental Policy (SHEP) 2008;
- Historic Scotland, Managing Change in the Historic Environment: Micro-Renewables, 2010;
- Historic Scotland, Managing Change in the Historic Environment: Setting, 2010.

Where the character of the historic building or place can be maintained, Historic Scotland support the development of renewable energy. The publication *'Managing Change in the Historic Environment: Micro-Renewables'*⁵³ sets out principles to be taken into consideration when planning a wind turbine development:

- Establish significance

Determine what is important about the historic place and its setting. For example, some historical buildings were originally designed to be visible from all directions, whereas others may have parts of lesser interest or less visible elevations.

Analysing the setting of a historic asset takes into account a number of factors; including how important its surroundings are to its character and how modern development is part of the experience of the historic asset today. The number of visitors to a site does not reflect the significance of its setting, although will be taken into consideration by a local planning authority.⁵⁴

- Identify potential impacts

These impacts can be physical and/or visual. Physical impacts can refer to deliberate alteration or accidental damage to historic buildings or their settings; or it can relate to physical impacts on the ground which effects archaeology.

Visual impacts are also a material consideration in the planning process: A turbine may be located in principal views of a historic building, or it may interrupt the spatial relationships with other buildings or natural features. Noise and vibrations will be taken into account in the following chapters, yet are important factors in regards to the historical environment.

- Siting and design

⁵³ Historic Scotland, Managing Change in the Historic Environment: Micro-Renewables, 2010

⁵⁴ Historic Scotland, Managing Change in the Historic Environment: Setting, 2010

Sensitive planning so that not only the wind turbines, but also the associated equipment and cabling, are sited to avoid principal elevations. Impacts will be minimised through, for example, specifying the minimum necessary diameter and length for cabling.

➤ Cumulative effects

There is the potential that additional wind turbine developments in the area will create a cumulative impact on the historic environment, therefore this must be taken into account.

b. Measuring Value

The tables below have been designed to assist in measuring how sensitive a historical asset is and how extensive the magnitude of the impact is from the proposed development. These are not all-encompassing, as they do not take into account all of the principles identified above, such as cumulative impact, which must still be assessed separately. Neither can they be used to provide an objective result, as professional judgement is still required;⁵⁵ however they remain a useful tool in order to easily take into account a number of important factors.

TABLE 7: SENSITIVITY: BUILT AND CULTURAL HERITAGE ON THE SITE⁵⁶

Sensitivity	Definition
High	Category A and B listed building Scheduled Ancient Monument Non-statutory list of sites likely to be of national importance Designed Gardens and Landscapes
Medium	Category C(S) listed building Archaeological sites on the Sites and Monuments record (of regional and local importance) Conservation Areas
Low	Archaeological sites of lesser importance Non-Inventory Gardens and Designed Landscapes

TABLE 8: MAGNITUDE OF BUILT AND CULTURAL HERITAGE EFFECTS

Magnitude of Impact	Definition
High	Any number of wind turbines and/or ancillary development that would result in: <ul style="list-style-type: none"> The removal or partial removal of key features, areas or evidence important to the historic character and integrity of the site, which could result in the substantial loss of

⁵⁵ Historic Scotland (2007) *Environmental Impact Assessment (Scoping): Scoping of wind farm proposal; assessment of impact on the setting of the historic environment resource; some general considerations.*

⁵⁶ Use of Wind Energy in Aberdeenshire Guidance for Assessing Wind Energy Developments August 2005

	<p>physical integrity; and/or</p> <ul style="list-style-type: none"> • A substantial obstruction of existing view by the addition of uncharacteristic elements dominating the view, significantly altering the quality of the setting or the visual amenity of the site both to and from. <p>Where the mechanical or aerodynamic noise from any number of wind turbines (or from other neighbouring wind energy developments) that are likely to detract from site amenity of a popular built or cultural heritage site managed as a visitor attraction adjacent to a wind energy development.</p>
Medium	<p>Any number of wind turbines and/or ancillary development that would result in:</p> <ul style="list-style-type: none"> • The removal of one or more key features, parts of the designated site, or evidence at the secondary or peripheral level, but are not features fundamental to its historic character and integrity; and/or • A partial obstruction of existing view by the addition of uncharacteristic elements which, although not affecting the key visual and physical relationships, could be an important feature in the views, and significantly alter the quality of the setting or visual amenity of the site both to and from. <p>Where the noise intrusion (mechanical or aerodynamic) from any number of wind turbines (or from other neighbouring wind energy developments) may detract from the amenity of a built or cultural heritage site adjacent to a wind energy development.</p>
Low	<p>Any number of wind turbines or ancillary developments that may result in:</p> <ul style="list-style-type: none"> • A partial removal/minor loss, and/or alteration to one or more peripheral and/or secondary elements/features, but not significantly affecting the historic integrity of the site or affect the key features of the site; and/or • An introduction of elements that could be intrusive in views, and could alter to a small degree the quality of the setting or visual amenity of the site both to and from <p>Where the noise intrusion (mechanical or aerodynamic) from any number of wind turbines (or from other neighbouring wind energy developments) is unlikely to detract from the amenity of a built or cultural heritage site adjacent to a wind energy development.</p>
Negligible	<p>Any number of wind turbines or ancillary developments that may result in:</p> <ul style="list-style-type: none"> • A relatively small removal, and/or alteration to small, peripheral and/or unimportant elements/features, but not affect the historic integrity of the site or the quality of the surviving evidence; and/or • An introduction of elements that could be visible but not intrusive in views, and the overall quality of the setting or visual amenity of the site would not be affected both to and from. <p>Where the noise intrusion (mechanical or aerodynamic) from any number of wind turbines (or from other neighbouring wind energy developments) would not have any noticeable effect on the amenity of a built or cultural heritage site adjacent to a wind energy development.</p>

c. Historic Environment Records (HERs)

The HERs analysed through this Environmental Report are:

World Heritage Sites (WHS)	The 1972 UNESCO World Heritage Convention was ratified by the UK in 1984. The Convention provides for the identification, protection, conservation and presentation of cultural and natural sites of “outstanding universal value.” The UK currently has 28 WHS.
Scheduled Ancient Monuments (SAMs)	Monuments of national importance given protection under the Ancient Monuments and Archaeological Areas Act 1979 by Scottish Ministers.
Listed Buildings	Listed buildings are structures of special architectural or historic interest protected under The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
National Monuments Record of Scotland (NMRS)	These contain the national collection of material relating to Scottish archaeological and architectural heritage.
Scottish Sites and Monument Records (SSMR)	The SSMR have been compiled by, or produced on behalf of, Scottish Local Authorities.
Cartographic Sources	OS 1 st and 2 nd Edition 6” maps, historical maps, and aerial records where available.
Other Designated sites	Industrial Heritage Sites, Conservation Areas and Gardens and Designed Landscapes.
Development Plans	These will be consulted to analyse their policies towards cultural heritage.
Research	Local Library services and reference books will be consulted where necessary.

iii. Designated Historical and Archaeological Sites near to The Corb

a. World Heritage Sites

There are no World Heritage Sites within 5km of the proposed turbine development.

b. Scheduled Ancient Monuments

TABLE 9: SCHEDULED ANCIENT MONUMENTS (SAMs) WITHIN 5KM OF THE PROPOSED TURBINE

Index No.	Name	Distance (~km)	Description	Sensitivity	Magnitude
4703	Corb	0.8	The monument is a large settlement of the later Bronze Age or Iron Age, some 2000-3000 years old. There are 16 stone-walled house stances mostly in a very good state of preservation, associated with the remarkably complete remains of a field system, marked by numerous irregular	High	Medium

			walls, lynchets and some stone clearance heaps. The houses are of two types, single-walled and double-walled 'Dalrulzion' designs.		
10516	Easter Bleaton	2.4	The monument comprises the well-preserved remains of a deserted settlement of post-medieval date. This well-preserved fermtoun lies in pasture some 400m E of Easter Bleaton, on a W-facing terrace at about 300m OD, at the foot of Knockali and immediately above the floor of Glenshee.	High	Negligible
7645	Whitehouse, hut circles	3.1	The monument comprises a group of hut circles and associated features of prehistoric date surviving as a series of earthworks. The monument lies in moorland at around 360m OD. It comprises three well-preserved hut circles and a series of associated field banks and small cairns. The remains form the best preserved part of a larger group of hut circles, several of which now lie under forestry.	High	Negligible
5777	Dalrulzion	3.5	The monument is a settlement of the later Bronze Age, some 2500 to 3000 years old, comprising the remains of seven houses and fragments of a field system and clearance cairns within a clearing in a forest. Six of the houses lie in a group near the western end of the area and the seventh lies at the eastern end. The houses are a mixture of double and single wall huts ranging in overall diameter from 8.5m to 14m in diameter. In the area around and between them are lynchets, field walls and clearance cairns, indicating the extent of the contemporary field system. Small parts of the settlement were excavated in the first half of this century.	High	Low
1507	Hillocks of Borland	3.7	The monument comprises a standing stone of prehistoric date. It is being rescheduled to clarify the extent of the scheduled area and to ensure that the archaeologically sensitive area is protected. The stone stands in arable farmland at around 310m OD. It comprises a granite standing stone oriented NNE-SSW, measuring about 1m high, 0.7m wide and about 0.2m thick. The stone was most	High	Negligible

			probably erected at a Neolithic or Bronze Age date and would have formed a focus for prehistoric ritual practices. The area proposed for scheduling comprises the stone and an area around it within which related material may be expected to be found. It is circular with a diameter of 25m, as marked in red on the accompanying map extract.		
5581	Craighead	3.7	The monument is a settlement and field system of the Bronze Age or Iron Age situated on the E flank of the Hill of Three Cairns. The settlement consists of eight circular houses constructed of stone-faced, rubble-filled walls. The northernmost house is of the double-walled 'Dalrulzion'-type, and two of the others are a pair of houses within a small enclosure. Immediately beside the doorway of the northern house of the pair is a cup-marked rock. Around the houses are elements of a field system, comprising field banks and clearance cairns, and small subsidiary structures. A forestry road runs through the monument. One of the houses, partly removed by the road, was excavated in 1983. The area to be scheduled includes the settlement, part of the field system and an area around them within which traces of activity associated with their use may be found. The area is irregular and measures a maximum of 200m N-S by 105m at its widest point, as marked in red on the attached map. A modern forestry road runs through the area to be scheduled; its structure above ground is specifically excluded from the scheduling.	High	Negligible
4674	Meall Beag	3.7	The monument is a group of three settlements and their associated field systems lying on the SW, S and SE slopes of Meall Beag. The westernmost settlement comprises the remains of four circular stone-walled houses, all of double walled "Dalrulzian" type varying in diameter from 10m to 16.5m between the centres of the outer walls. The middle settlement comprises the remains of four circular houses; one is a "Dalrulzian" type 17m in diameter, another is of single wall type 9m	High	Negligible

			in diameter.		
4546	Redlatches	4.4	The monument is a settlement and field system of the later Bronze Age/Iron Age situated on an east facing hillslope. The settlement comprises the remains of eleven circular stone-walled houses, divided into two small groups. Five are set into the spine of a ridge on the NE slope of the hill. Four are 10m in diameter; the fifth is 13m in diameter. The second group, of six, lies c100m to the S. They vary in diameter from 6.2m to the largest at 12.5m.	High	Negligible
4540	Redlatches	4.4	The monument is a settlement of the later Bronze Age/Iron Age some 2000 to 3000 years old, situated on a slight W facing slope on heather moorland. It comprises the remains of six circular stone-walled houses, five of them in an E-W line, the sixth set slightly to the N. Two of the houses are of "Dalrulzion" type, that is they have double walls.	High	Negligible
4673	Redlatches	4.4	The monument is a settlement and contemporary field system of the later Bronze Age/Iron Age (some 2000 to 3000 years old) situated on an east facing slope. It lies in a clearing left in a recently ploughed and planted forest. It comprises the remains of six circular houses arranged in a rough line along the contour. Five of the houses are of "Dalrulzion" type, having a double wall. They measure about 16m in diameter.	High	Negligible
6911	Birkhill	4.8	The monument comprises the remains of a series of burial and field clearance cairns of prehistoric date surviving as turf-covered mounds in rough pasture. The monument lies on relatively level ground around a pond on the N flanks of Druim Dearg at around 350m OD. The largest of the cairns is represented by a substantial, grass-covered, stony mound some 7m in diameter and about 1m high, lying immediately N of the pond. Fairly large stones set together forming a kerb can be seen, particularly on the SW side.	High	Negligible
7309	Birkhill	4.8	The monument comprises the remains of two ring ditch houses and associated features of prehistoric date.	High	Negligible

			The monument lies on a relatively well-drained patch of moorland close to the W bank of the Dalmochy Burn at around 340m OD. It comprises two adjoining ring ditch houses and a third possible house stance or yard. The W ring ditch measures some 9m overall with a well-defined central platform some 2.5m in diameter surrounded by a shallow ditch.		
--	--	--	--	--	--

Impacts on SAMS

Of the twelve SAMS listed in the table above, all but two lie out-with the ZTV of the proposed turbine; these are Corb and Dalrulzion. The Corb is a large settlement of the later Bronze Age or Iron Age, some 2000-3000 years old. This settlement lies 0.8km north of the proposed turbine location. The historic setting of this SAM has been significantly altered, as the wider views of the landscape will encompass Drumderg windfarm, which has altered the historic setting. The site also has no footpaths and so it is unlikely that there will be any tourism associated with the monument. The turbine will be relatively dominant in views to the southeast from the monument due to its proximity to the development site and there is no vegetation present to screen the turbine from this SAM. However due to the historic setting being altered by the presence of Drumderg windfarm within wider landscape views southeast of the monument; it is perceived that a single turbine will have a medium impact on Corb.

Dalrulzion is also a settlement of the later Bronze Age, some 2500 to 3000 years old, comprising the remains of seven houses and fragments of a field system and clearance cairns within a clearing in the forest. Six of the houses lie in a group near the western end of the area and the seventh lies at the eastern end. This settlement is located 3.5km west of the proposed turbine. There is a large volume of woodland surrounding the settlement; subsequently, the impact will be lowered due to the vegetation screening views of the turbine from the monument. There are also no artificial elevations to consider with these monuments. Even if there are intermittent views from the site through the vegetation, due to the distance between the proposed development and the monuments, the turbine will not appear dominant within the landscape. This distance from the turbine, combined with the screening means the impact of the proposed turbine on this monument will be low.

It has to be remembered that The Corb wind turbine development falls into the Highlands Summits and Plateaux/Highland Foothills landscape as described in the Landscape Character Assessment (Tayside). This landscape is described as heavily evolved by man through deforestation, grazing, heather burning etc. The landscape and land-use has evolved through human intervention and estate management including wind farming, therefore the erection of this single turbine in conjunction with these operations does not provide a significant negative impact to historical setting.

c. Listed Buildings

TABLE 10: CATEGORY A LISTED BUILDINGS WITHIN 10KM OF THE PROPOSED TURBINE

HBNUM	Parbur	Category	Description	Sensitivity	Magnitude
5674	Blackcraig Bridge	A	Wide segmental arch carrying segmentally barrel vaulted transe with balustraded opening to view the river. Gates at either end, flanked by turrets, cape-house containing bridge-keepers residence on top. Building adjoins with stair turret linked by small stone gangway to turret at cape house level on main bridge. Patrick Allan-Fraser, Archt., 1870.	High	Negligible
19803	Haugh of Drimmie, suspension bridge	A	Single lane wrought iron of about 100' span: wooden deck. No cables - suspension rods from w.i. arches direct to decking. Before 1837.	High	Negligible

TABLE 11: CATEGORY B LISTED BUILDINGS WITHIN 5KM OF THE PROPOSED TURBINE

HBNUM	Parbur	Category	Description	Sensitivity	Magnitude
4373	Drumore Loch	B	Dated 1864 at inset stone. Small single-storey Whitewashed rubble and slate with cantilevered wooden verandah gable to loch.	High	Negligible
42919	Drumfork House	B	1748. 2-storey, 3-bay rectangular-plan house with modern single storey wing to right. Harled and painted rubble with painted ashlar margins and dressings. Base course, band course, quoin strips, chamfered reveals. MAIN ELEVATION: later boarded wooden porch advanced at	High	Negligible

			centre, blocking course, 2-leaf 6-panelled door. Window directly above, 2 flanking bays symmetrically disposed. Square dormers off-centre to right. Single storey canted bay advanced to outer right.		
4371	Drumfork Bridge	B	Dated 1878 at inset granite shield. Large single segmental arch, curved at approaches	High	Negligible

Impacts on Listed Buildings

In regards to listed buildings, there are five two category A listed buildings within 10km and three category B listed buildings within 5km of the proposed turbine. All of these are located outside ZTV area. Drumfork house is in an area of raised elevation, however as the building is out-with the zone of theoretical visibility, there will be no visible effect from this property, Drumfork Bridge or Drumore loch, meaning the impact upon the sites are negligible.

d. National Monument Records of Scotland and Scottish Sites and Monument Records

TABLE 12: NMRS WITHIN 1KM OF THE PROPOSED TURBINE

Canmore ID	Name	Monument Type	Description
29042	Knockali, Corrie Burn	Building, Enclosure	Situated at the rear of a narrow W-facing terrace at the head of the valley of the Drumturn Burn, there are the remains of a building which measures 24m in length by 4.5m in width at the NNE end and 8m in width at the SSW end and over a stony bank about 1.5m thick and 0.5m in height. In contrast with the square N end, the S end is rounded and at this end the interior has been levelled into the slope. The entrance is situated on the W side and on the E, uphill, side there is a drainage hood/gully.
29048	Cairn, Badnaspeorach	Enclosure	The remains of a small circular enclosure are situated at the foot of the W flank of a rocky knoll on the W flank of the ridge known as Burnt Cairns. It measures 7.3m in diameter within a bank up to 1.8m in thickness by 0.2m in height. The bank is composed of fairly large boulders, one of which is set upright on the W and stands about 0.5m high. There is an entrance on the W. Slightly S of the centre of the interior, there is a mound measuring about 2.8m in diameter by 0.3m in height. It is likely that the name Cairn Badnaspeorach refers to

			the rocky knoll rather than the enclosure.
29004	Corb	Building(s), Castle	All that remains of this castle is a low grass-covered mound measuring 18m from E to W by 12m transversely. In its immediate vicinity, though not tightly grouped, there are at least five buildings, all reduced to their stone wall-footings. Of the two largest buildings one is of at least four compartments and measures 26.3m from E to W by 4.6m transversely overall, whilst the other is of three compartments and measures 17.5m from WNW to ESE by 6.4m transversely overall. The remaining buildings range in size from 5.9m by 4m to 14.4m by 4.1m overall; two are of a single compartment, but the third may be of two compartments.
29005	Drumturn Burn	Field System, Hut Circles	Immediately to the NE there are traces of a pair of hut-circles set close together. Their walls have been almost totally robbed, but the arcs of their uphill sides are preserved in the leading edge of a field on the slope immediately to the NE. The southerly of the pair measures 4m in internal diameter and the entrance was on the W where there is now a large gap 2.6m wide. Where best-preserved its bank is about 1.8m thick by 0.3m high. The northerly hut-circle which has been more severely robbed, measures about 4.7m in internal diameter; its E side is bounded by a stony scarp about 0.5m high, which forms part of the field boundary, but elsewhere all that survives of its perimeter is two low banks separated by a shallow groove 0.8m broad. The entrance was probably on the SSE.
29006	Drumturn Burn	Building, Enclosure, Shieling Hut (Possible)	Situated on a prominent heather-covered knoll in the bottom of the valley and immediately E of the Drumturn Burn, there are the remains of a small enclosure which is defined by a ditch measuring up to 1.5m in breadth by 0.15m in depth and 8.5m in overall diameter. There is a narrow causeway on the SSE and this corresponds with an entrance gap in the low, outer bank (1m thick and 0.1m high). Within the enclosure there is a low, amorphous spread of stone which was masked by a thick growth of heather on the date of visit. Situated 2m NNE of the enclosure there are the remains of a poorly-preserved structure (possibly a shieling-hut) which measures about 3m in diameter within walls reduced to a low stony bank about 1m thick and 0.1m high.

29022	Mill of Drumturn	Farmstead, Mill	Three unroofed buildings annotated as Ruins are depicted on the 1st edition of the OS 6-inch map (Perthshire 1867, sheet xlii). Two unroofed buildings attached to an incomplete enclosure are shown on the current edition of the OS 1:10000 map (1976).
29026	Corrie Burn	Field System, hut circles	This group of hut-circles is situated at a height of about 400m OD on the S flank of the hill known as Burnt Cairns. The field-system extends down the slopes below the hut-circle and comprises a large enclosure of at least 6ha with two subsidiary enclosures on its upper side. Within the enclosure there is a group of small cairns concentrated on the slopes immediately below the hut-circles. The area is crossed by a series of hollow trackways; these are presumably of later date, but in places large boulders belonging to the enclosure bank lie in the bottom of the tracks.
29027	Corb	Hut Circle	Situated upon a low N-S ridge within heather moorland 1km WSW of Corb farmhouse there are the remains of a hut-circle defined by the robber- trenches of the inner and outer faces of a wall originally 2.6m thick. Internally the hut-circle measures 10.5m in diameter but the only tangible remains of the inner face, apart from the robber-trench, are three large boulders on the NE. Externally the hut-circle measures up to 15.8m in diameter with the line of the outer face exclusively marked by a robber-trench. The entrance is probably situated on the ESE where the wall structure appears to have survived better than elsewhere.
29028	Corb	Cairn(s)	A group of at least six cairns measuring up to 3m in diameter and 0.3m in height is situated on the SW flank of Beddiegrew some 700m NNW of Corb farmhouse.
131092	Corb	Farmstead	A farmstead comprising two unroofed, three roofed buildings, one of which is a long building approximately 50m in length, and a field is depicted on the 1st edition of the OS 6-inch map (Perthshire 1867, sheet xlii). Two roofed buildings, one enclosure and the field are shown on the current edition of the OS 1:10000 map (1976).
MPK3983	Drumturn Burn	Hut settlement, Circle Field System	This monument comprises the remains of at least 22 hut circles and platforms, alongside a substantial late-prehistoric field system. They are located on the SW slope of Beddiegrew Hill. The hut circles vary between 4m to 16m in diameter, and include single and double-walled structures. The field system comprises

			numerous field banks and stone clearance cairns.
MPK4000	Mill of Drumturn	Mill, Farmstead	No description available
MPK3982	Corb	Building	No description available
MPK4005	Corb	Hut Circle	No description available
MPK3984	Drumturn Burn	Building, Enclosure, Shieling Hut	No description available
MPK4026	Cairn Badnaspeorach	Enclosure	No description available
MPK4020	Knockali, Corrie Burn	Pitcarmick, Enclosure	No description available
MPK4004	Corrie Burn	Field System, Hut Circle, Rig and Furrow	No description available
MPK4006	Corb	Cairn	No description available

Impacts on NMRs and SSMRs

Within 1km of the proposed turbine location, there are twenty-one SSMRs and NMRS which can theoretically be visually impacted by the proposed turbine. Corb cairn and Corb enclosure may have a significant impact due to the distance of the turbine from these sites. Both the cairn and enclosure are located directly south of the proposed turbine location. The historic setting of these sites has changed significantly as there is now a modern farm steading present within the landscape. As well as the farmstead, the wider landscape has a sixteen turbine Windfarm present. However, due to the scale of the turbine and the distance from Corb cairn and enclosure, the visual impact upon these NMRs and SSMRs is likely to be high.

Knockali is a building/enclosure situated at the rear of a narrow west-facing terrace at the head of the valley of the Drumturn Burn; and the remains of a building, with a west facing aspect. The west facing aspect of Knockali will reduce the visual impact as it is out with the direct line of site to the proposed turbine. The land to the west of the turbine is undulating; therefore the landscape will offer some screening from the turbine. Due to the distance from the turbine and the aspect of this building being west, it is perceived the impact on this structure will be medium.

There are many structures which may be visually impacted due to their location along Drumturn Burn, and include: Drumturn Burn (29005, MPK3983); Drumturn Burn (29006, MPK3984); Mill of Drumturn (29022, MPK4000); and Drumturn Burn (MPK3983). All of these structures are located to the west of the proposed turbine. The field system and hut circle NMRs and SSMRs

(MPK3983) has an aspect of southeast, meaning the aspect of the hut circles does not lie in direct line of sight to the turbine. Also, due to the distance from the proposed turbine and the undulating topography which will partially shield the turbine, the impact upon Drumturn Burn hut circles and field system will be medium. Drumturn burn Enclosure and possible shieling hut is also located to the west of the proposed turbine, situated on a prominent heather-covered knoll in the bottom of the valley. Due to its location within the valley floor and the undulating topography that will partially shield this enclosure, the impact upon this site will be medium. The farmstead which was present now appears to be in a ruinous state; however, there will still be a visual impact upon the structure. The farmstead is located to the west of the turbine location and is now set within a modernising landscape, including modern farm steadings and the presence of Drumderg Wind Farm to the east of the structure. As the farmstead is in a ruinous state, there is a lack of discursive architecture and as such is likely to have a low appeal in terms of tourism.

Cairn, Badnaspeorach is the remains of a small circular enclosure which is situated at the foot of the west flank of a rocky knoll. It measures 7.3m in diameter within a bank up to 1.8m in thickness by 0.2m in height. There is an entrance to the cairn to the west, making the aspect of this structure westerly. The structure is located to the north of the turbine, meaning that the views westerly will be not be in direct line of sight to the proposed turbine; however, the southerly views will be significantly impacted by the turbine as it will form a dominant feature in the landscape. The impact upon this cairn will be low/medium as some views from and to the monument will be significantly effected but the wider landscape encompasses views of existing turbines and the proposed turbine will only be visible in certain views from the monument.

Corrie Burn Field system/Hut Circles is a group of hut-circles is situated at a height of 400m OD to the south of the hill known as Burnt Cairns, and is directly north of the proposed turbine. Within the enclosure there is a group of small cairns concentrated on the slopes immediately below the hut-circles. As the turbine is located directly south, it will have a high impact due to the topography of the land, and the hut circles high siting in the landscape. It should be recognised that the landscape has become more modern, with the presence of modern farm steadings also to the south of the hut circles but this change is likely to be fairly insignificant. As such the turbine is likely to have a high impact upon these monuments.

Finally, the proximity of the wind farm present in the wider landscape has to be taken into consideration, as this will reduce the impact of the single turbine proposal at The Corb.

iv. Mitigation Measures

The proposed development at The Corb has been sited to provide as much terrain shielding as possible within the landscape. A consequence of this has been that the zone of theoretical visibility (ZTV) is fairly limited. Due to the significant terrain shielding there is a negligible impact on the majority of high sensitivity sites. There is a higher impact on the sites of low sensitivity but in terms of an overall impact on cultural heritage the effect of the proposed development is

low. The original position and size of the turbine has also been amended to reduce the impact of the turbine in the wider context of the landscape and as such has reduced the impact on sites of cultural heritage at a greater distance from The Corb. These changes have had a less significant impact of the effect on the NMRS and SSMRs in closer proximity to the proposed development but, as stated, these sites are a lower archaeological sensitivity.

As well as this, it has to be remembered there is a 16 turbine Windfarm to the southeast of the proposed turbine location. Due to the scale of the wind farm and the careful positioning of the single turbine proposal to be read visually as part of this existing development, the impact of the single will be greatly reduced.

There are relatively few sites in the vicinity of the development which should negate the requirement for pre-development testing or a watching brief; however if required it will be undertaken as part of the project.

It is also important to consider that this development is of a temporary nature and is presumed to only exist in the landscape for 25 years. At this point the turbine will be removed from the site the track will be re-instated through the use of topsoil, and underground cables cut.

Further mitigation on the cultural heritage and archaeology within the area has been achieved by moving the turbine location further north within the land boundary, reducing the visual impact of the turbine, as the previous location was very prominent in the landscape.

9. NOISE ASSESSMENT

The noise levels of a turbine depend on various factors, such as the turbine's power level, background noise, wind speed and the sensitivity of nearby dwellings etc. In general, the turbine proposed in this development is quiet in operation.

Wind Turbine Noise Characteristics

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 is normally between 3 and 5 metres per second (m/s) and the cut out wind speed is normally around 25 m/s.

The principal sources of noise are from the blades rotating in the air (aerodynamic noise) and from internal machinery, normally the gearbox and, to a lesser extent, the generator (mechanical noise). The blades are carefully designed to minimise noise whilst optimising power transfer from the wind. The nacelle at the top of the tower is insulated to minimise noise radiation from the gearbox, generator and other components which are also isolated from the tower and the blade assembly to prevent structure borne noise.

Noise in the Environment

Although the source noise levels are of a benign nature, 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 normally 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.

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. PAN 1/2011⁵⁷, Planning and Noise, 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 or doubling the loudness of a sound."* Table 10 shows typical levels of noise in the environment.

PAN 1/2011

Well-designed wind turbines are generally quiet in operation. The table below gives an indication of the noise generated by wind turbines compared with other everyday activities.

⁵⁷ PAN 1/2011; <http://www.scotland.gov.uk/Resource/Doc/343210/0114180.pdf>

Since the early 1990s, there has been significant reduction in the mechanical noise generated by wind turbines and it is now usually less than, or now of a similar level to, the aerodynamic noise. Aerodynamic noise from wind turbines is generally unobtrusive; it is broad band in nature and in this respect similar to, for example, the noise of wind in trees.

Wind generated background noise increases with wind speed, and at a faster rate than wind turbine noise increases with wind speed. The difference between the noise of the wind farm and the background noise is therefore liable to be greatest at low wind speeds. Varying the speed of the turbines in such conditions can if necessary, reduce the sound output from modern turbines.

From: "*The Assessment and Rating of Noise from Wind Farms*" (ETSU for DTI 1996).

- Noise limits should be applied to external locations and should apply only to those areas frequently used for relaxation or activities for which a quiet environment is highly desirable;
- A fixed limit of 43dB(A) is recommended for night-time. This is based on a sleep disturbance criteria of 35dB(A) with an allowance of 10dB(A) for attenuation through an open window (free field to internal) and 2dB(A) subtracted to account for the use of L A90,10min rather than L Aeq,10min;
- Both day and night-time lower fixed limits can be increased to 45dB(A) to increase the permissible margin above background where the occupier of the property has some financial interest in the wind farm;
- In low noise environments the day-time level of the L A90,10min of the wind farm noise should be limited to an absolute level within the range of 35-40dB(A). The actual value chosen within this range should depend upon; the number of dwellings in the neighbourhood of the wind farm; the effect of noise limits on the number of kWh generated; and the duration of the level of exposure;
- For single turbines or wind farms with very large separation distances between the turbines and the nearest properties, a simplified noise condition may be suitable. If the noise is limited to an L A90,10min of 35dB(A) up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary.

Table 13 provides comparisons to the noise expected by this development with other activities.

TABLE 13: INDICATIVE NOISE LEVELS⁵⁸

Source / Activity	Indicative noise level dB(A)
Threshold of pain	140
Jet aircraft at 250m	105
Pneumatic drill at 7m	95
Truck at 30mph at 100m	65
Busy general office	60
Car at 40mph at 100m	55
Quiet bedroom	35
Rural night-time background	20-40
Threshold of hearing	0

In regards to the development proposed in this document, various measures have been put in place to avoid noise nuisance. Through desk based and site surveys the turbine has been positioned at such a distance to create the appropriate separation between the development and any noise sensitive areas. Where possible, terrain shielding and noise barriers have been established to reduce noise impacts further.

⁵⁸ Adapted from PAN1/2011

10. SHADOW FLICKER

A recent study, published in March 2011 by the Department of Energy and Climate change, shows the effects of shadow flicker from wind turbines. Research undertaken by Parsons Brinckerhoff concluded that:⁵⁹

- There have not been extensive issues with shadow flicker in the UK
- The frequency of the flickering caused by the wind turbine rotation is such that it should not cause a significant risk to health. In the few cases where problems have arisen, they have been resolved effectively using mitigation measures, in particular, turbine shut down systems. The Government has reviewed the report findings and concluded that the existing planning guidance on shadow flicker is fit for purpose and no changes to it are required.

The following is the definition of Shadow Flicker in according to PAN45 Renewable Energy Technologies;

“Under certain combinations of geographical position, time of day and time of year, the sun may pass behind the rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off; the effect is known as “shadow flicker”. It occurs only within buildings where the flicker appears through a narrow window opening.”

It is suggested that in general, a separation distance of 10 times the rotor diameter (in the case of this model 580m) is required between the wind turbine and any properties potentially affected. This shall ensure that the any issues regarding shadow flicker are mitigated.

⁵⁹ Dept. Energy and Climate Change. http://www.decc.gov.uk/en/content/cms/news/pn11_025/pn11_025.aspx

11. AVIATION EFFECTS

Wind turbines can at times interfere with Air Traffic Control Radar. The blade movement can cause intermittent detection by radars whilst in operation. This problem occurs when the wind turbine blades are in line of sight the radar antenna. Due to their height, they can also impact upon airports and airfields if they project into the safeguarding surface above and around them.

VG Energy has a suite of GIS based maps for MOD, NATS en-route and ATC line of sight. These maps show that the turbine development should not be in the line of sight to any of these installations, although we understand that consultation with the relevant parties will be required also. Such consultations will be undertaken through the planning process to ensure compliance with all potential radar constraints.

12. TRAFFIC AND TRANSPORT

Construction of the turbine is expected to occur over 4 weeks and a rough programme can be found in the appendix. The volume of vehicle traffic is expected to be light overall with a few days of heavy unloading. At this stage the following gives the best indication the main traffic volumes.

- Average/Typical Traffic: 1-2 trucks per day and 2 light vehicles per day;
- 150t of type 1 for the access track over 2-4 days;
- Roughly 14 concrete deliveries all on the same day;
- 200 tonne crane, which will generally remain on site during construction;
- A single turbine installation should require only four trips to site for component delivery.

The four deliveries to site for turbine components include: a tower base section, a tower top section, a pair of blades in cradles, a nacelle and electrical cabinet. The 200t crane required for assembly of the turbine will be delivered as a permitted load under Roads Vehicles (Construction and Use) Regulations 1986 (C&U).

The size and weight of the components of the G58 are detailed in the following table.

TABLE 14: SIZE AND WEIGHT OF G58 COMPONENTS

Turbine Component	Length (m)	Width (m)	Height (m)	Net weight (tonnes)
Nacelle in transport frame	5.7	2.4	2.5	22
Pair of blades in cradles	25.3	0.33	2.3	10
Tower top section (55 m tower)	24.45	2.44	2.44	20
Tower base section (55 m tower)	28.60	3.32	3.32	38.46

Turbine components such as blades, motors and tower sections will be transported on a 14m long artic flatbed lorry which is extendable to 21m. Since the longest length of the turbine is the pair of blades in cradle at 16.8m, the lorry trailer will not be extended more than 17m which is permitted under Roads Vehicles (Authorisation of Special Types) (General) Order 2003 (AofST).

The widest part of the turbine is the nacelle at 2.4m. Load widths under 2.9m are permitted under Roads Vehicles (Construction and Use) Regulations 1986 (C&U).

The heaviest load transported to site will be the nacelle at 11 tonnes. This is under the maximum authorised weight for vehicle combinations as set out in Road Vehicles (Authorised Weight) Regulations 1998.

For a single turbine installation (after construction of the track), it is anticipated that the following truck visits to the site would be required over the construction period:

- Delivery of excavator;
- Delivery of shuttering and foundation reinforcing steel (may require two trucks);
- Delivery of concrete for foundation. An 81m³ foundation would require 14 truck movements (assuming a capacity of 6m³ per truck). The number of truck movements will vary with capacity and volume of concrete required;
- Removal of shuttering;
- Removal of excavator;
- Crane on site for the duration of the construction period;
- Delivery of tower base section;
- Delivery of tower top section;
- Delivery of pair of blades in cradles;
- Delivery of nacelle electrical cabinet;
- Removal of equipment and transport frames.

More visits may be required due to site conditions, weather restrictions, etc., and these numbers should be treated as a guideline only for planning purposes. The delivery of additional materials for road construction / upgrade is not included in this estimate.

13. DELIVERY AND CONSTRUCTION ACCESS ROUTE

The site will be accessed via the public road network, then by an access track which leads to The Corb. A detailed transportation assessment will be compiled and submitted to the relevant roads department at least two months before any deliveries take place.

A desk top study of the route has been done and no upgrades to the existing road network are necessary for it to be negotiated by the artic lorry which will deliver the components.

The oncoming vehicles will be controlled by appropriately qualified staff within the attendant vehicle travelling with the truck warning on-coming traffic to slow down and stop until the manoeuvre has been completed.

14. EXISTING INFRASTRUCTURE

Wind farms have the potential to interfere with electro-magnetic signals passing above ground or existing infrastructure below ground. Consultation with relevant telecommunication and utilities providers is a routine part of wind farm development. Consultees will include:

- Civil Aviation Authority (CAA);
- Defence Estates, MoD;
- NATS;
- OFCOM;
- Television and telecommunications providers as appropriate; and
- Water, gas and electricity utilities providers.

Information obtained from the consultees will be taken into account and incorporated into the design of the development.

15. GENERAL SAFETY

Construction Projects have a potential to create hazards for the general public and contractors. The greatest hazards occur during the construction, repair works and decommissioning of the turbines but the risks will be minimised by ensuring work complies with the following regulations:

- Health and Safety at Work Act 1974;
- Management of Health & Safety at Work Regulations 1999;
- Work at Height Regulations 2005;
- Lifting Operations & Lifting Equipment Regulations 1998;
- Control of Substances Hazardous to Health Regulations;
- SEPA Regulations.

All work will be planned to be completed within normal working hours, with noise levels limited where possible. A site traffic management plan will ensure works traffic does not endanger the public whilst entering or leaving the site.

Working at height shall be mitigated where possible, but because of the nature of the project will at times be essential. All working at height will comply with Work at Height Regulations 2005.

All works will be done by suitably trained and competent staff, to established methodologies, which have been risk assessed in advance. During the construction period, public access will be prevented and the site supervisor will ensure that safety is paramount.

The wind turbine being considered for use at The Corb is designed and manufactured to high standards and will withstand the weather extremes which arise in the United Kingdom.

APPENDIX A

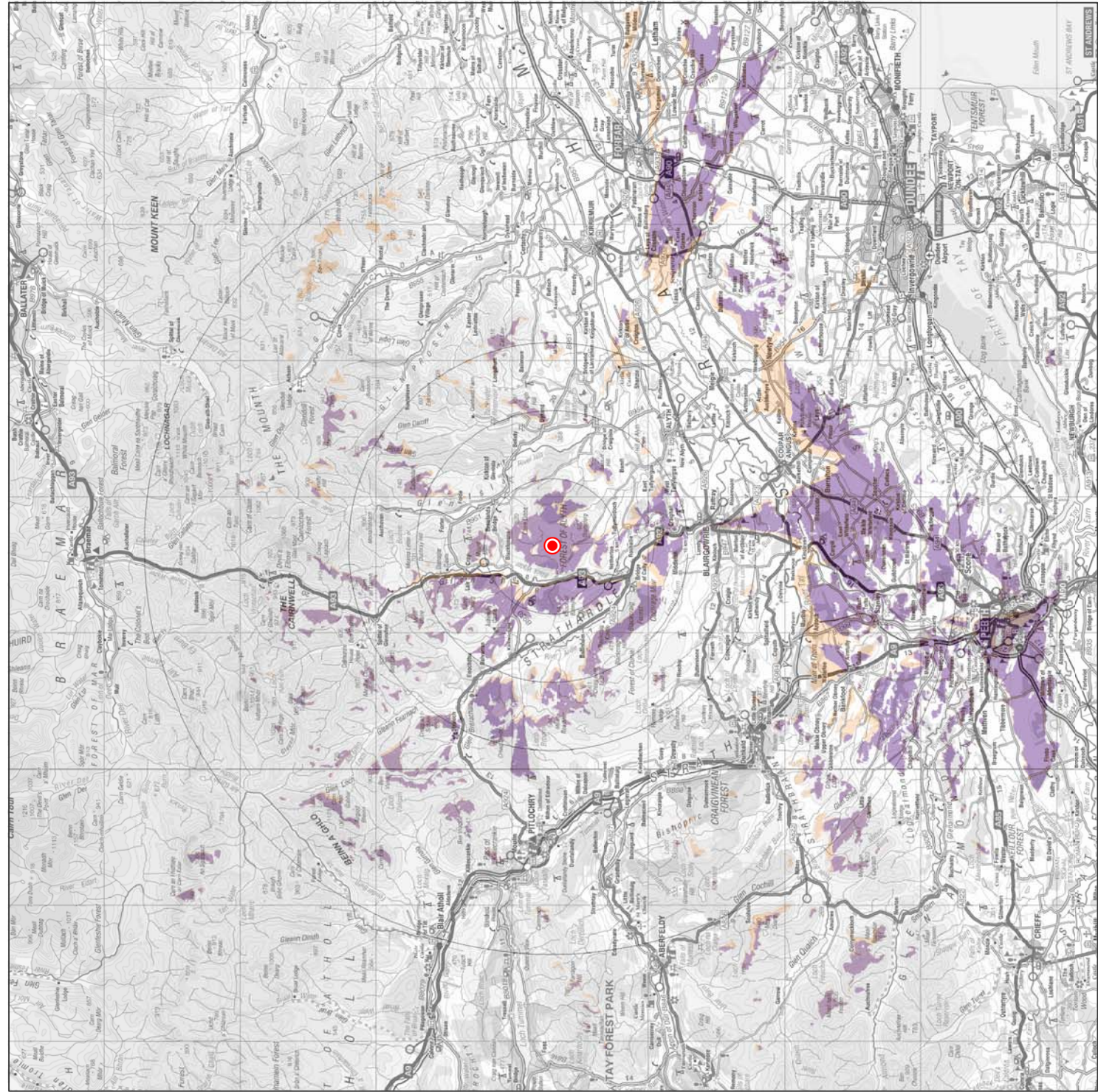
- Figure 1:** ZTV of The Corb 84m (to tip) turbine over a 30km Radius
- Figure 2:** Viewpoint Location Map with ZTV overlay
- Figure 3:** Photomontage 1: Site Entrance on the Tullymurdoch and Alyth Local Road
Wireframe 1a
- Figure 4:** Photomontage 2: Knock of Balmyle Hill (Hill of Persie)
Wireframe 2a
- Figure 5:** Photomontage 3: Creigh Hill by Backwater Reservoir
Wireframe 3a
- Figure 6:** Photomontage 4: B950 Pitlochry Road
Wireframe 4a
- Figure 7:** Photomontage 5: A93 at Glenshee Pottery
Wireframe 5a
- Figure 8:** Major Windfarms: Proposed, Consented & Operational within 35km of The Corb
- Figure 9:** The Corb Site Layout
- Figure 10:** Detailed Site Drawing
- Figure 11:** Topographical Block Plan
- Figure 12:** Cross Section of The Corb
- Figure 13:** Designated Environmental Sites within 20km of The Corb
- Figure 14:** Map of Local Cultural Heritage and Archaeology to 5km of The Corb

APPENDIX B

Gamesa Noise Report

APPENDIX C

Ecology Report



ZTV to Blade Tip, and
Hub Height at 30km Radius

Proposed Turbine Location
E: 316389, 757051

5, 10,15 & 30km's Radius

Zone of Theoretical Visibility
(to blade tip)

Zone of Theoretical Visibility
(to hub height)

The Corb Turbine Details:

Height to Blade Tip: 84m

Hub Height: 55m

Blade Diameter: 58m

Notes:

This ZTV is computer generated from OS Landform
Panorama DTM Data. It does not account for vegetation
or built structures which may screen views. The earth's
curvature and atmospheric refraction is included.
Viewer height above ground is 2.0m

0

2.25

4.5

9

Kilometers

1:290,000

N

Ordnance Survey © Crown Copyright 2012.
All rights reserved. Licence number: 100020449

Site Name:
The Corb

Client:
Norman Bailey

Site Reference:
00206

Drawing Ref No:
Date: 19/10/2012

User: stephen.waters

VG





ENERGY

Waterside Farm
Glasgow Road
Galsion KA4 9PB
t: 01563 829999
f: 01563 829383
e: info@vgenenergy.co.uk
w: www.vgenenergy.co.uk

723

**Figure 2: Viewpoint Locator
Map for The Corb, Bridge of Cally**

Legend:

-  The Corb Turbine Location
E316389 N757051
-  Zone of Theoretical Visibility
(to blade tip)
-  Viewpoint Location
VP1
-  10km Radius

Viewpoint Location:

- VP1: E315825 N755607
- VP2: E312815 N756274
- VP3: E326419 N758424
- VP4: E311774 N759857
- VP5: E314260 N763487

Notes:
This ZTV is computer generated from OS Landform
Panorama DTM Data. It does not account for vegetation
or built structures which may screen views. The earth's
curvature and atmospheric refraction is included.
Viewer height above ground is 1.75m

0 0.75 1.5 3 Kilometers

1:100,000

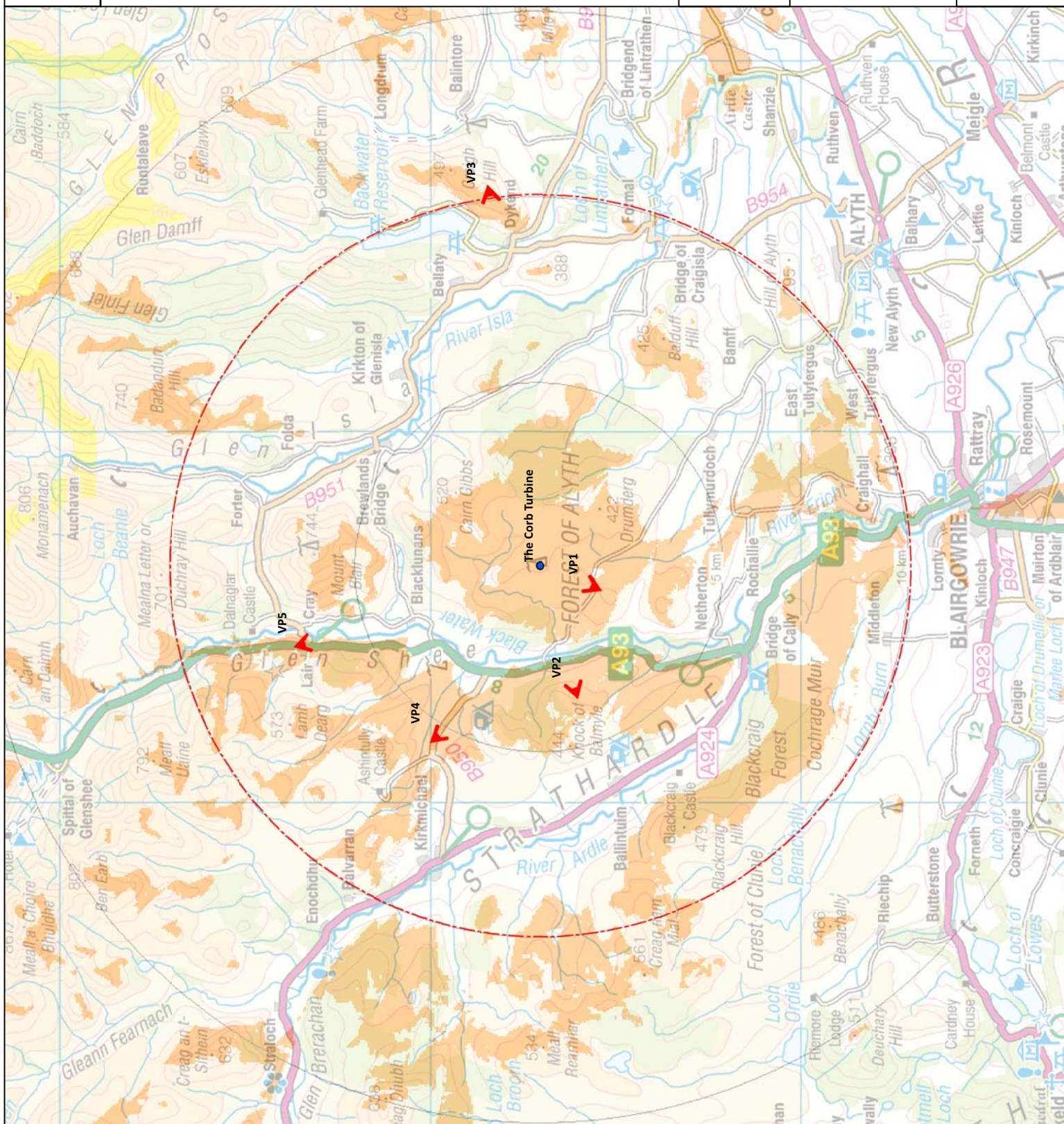


Ordnance Survey © Crown Copyright 2012
All rights reserved. Licence number 100020449

Site Name: The Corb
Client: Mr. N. Bailey
Site Reference: WV1020
Drawing Ref No: 008a
Date: 26/10/2012
Drawn by: chris.lockett



Watenside Farm
Glasgow Road
Gallatin KA4 8PB
t: 01563 829999
f: 01563 829383
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk






725

Tullymurdoch and Alyth Road at Site Entrance

Recommended Viewing Distance: 500mm

<u>Photomontage 1 (Figure 3)</u>
<u>Viewpoint Details</u> Viewpoint Location: E315825 N755607 Distance to Proposed Turbine: 1.5 km Ground Height (AOD): 355 m
<u>Photomontage Details</u> Field of View: 40 degrees Camera Height (AOD): 1.75m Camera:Fujifilm Finepix HS20 EXR Focal Length: 50mm, Full Frame Sensor Date Photograph Taken: 28/09/2012 Time Photograph Taken: 13:45
<u>Turbine Details</u> Model: Gamesa, G58 Hub Height: 55 m Rotor Diameter: 58 m Height to Blade Tip: 84 m
Site Name: The Corb Client: Mr N. Bailey Site Reference: WV1020 Drawing No: 009a Date: 03/10/2012 User: chris.lockett
 <small>Renewable Technology Solutions Vanguard Energy Glasgow Road Glasgow G3 7NF T: 01693 520909 E: info@vgenergy.co.uk W: www.vgenergy.co.uk</small>

Wireframe 1a

Viewpoint Details

Viewpoint Location: E315825 N756103
Distance to Proposed Turbine: 1.5 km
Ground Height (AOD): 355 m

Wireframe Details

Field of View: 40 degrees
Camera Height (AOD): 1.75m
Camera: Fujifilm Finepix HS20 EXR
Focal Length: 50mm, Full Frame Sensor
Date Photograph Taken: 28/09/2012
Time Photograph Taken: 13:45

Field of View: 40 degrees
Camera Height (AOD): 1.75m
Camera: Fujifilm Finepix HS20 EXR
Focal Length: 50mm, Full Frame Sensor

Date Photograph Taken: 28/09/2012
Time Photograph Taken: 13:45

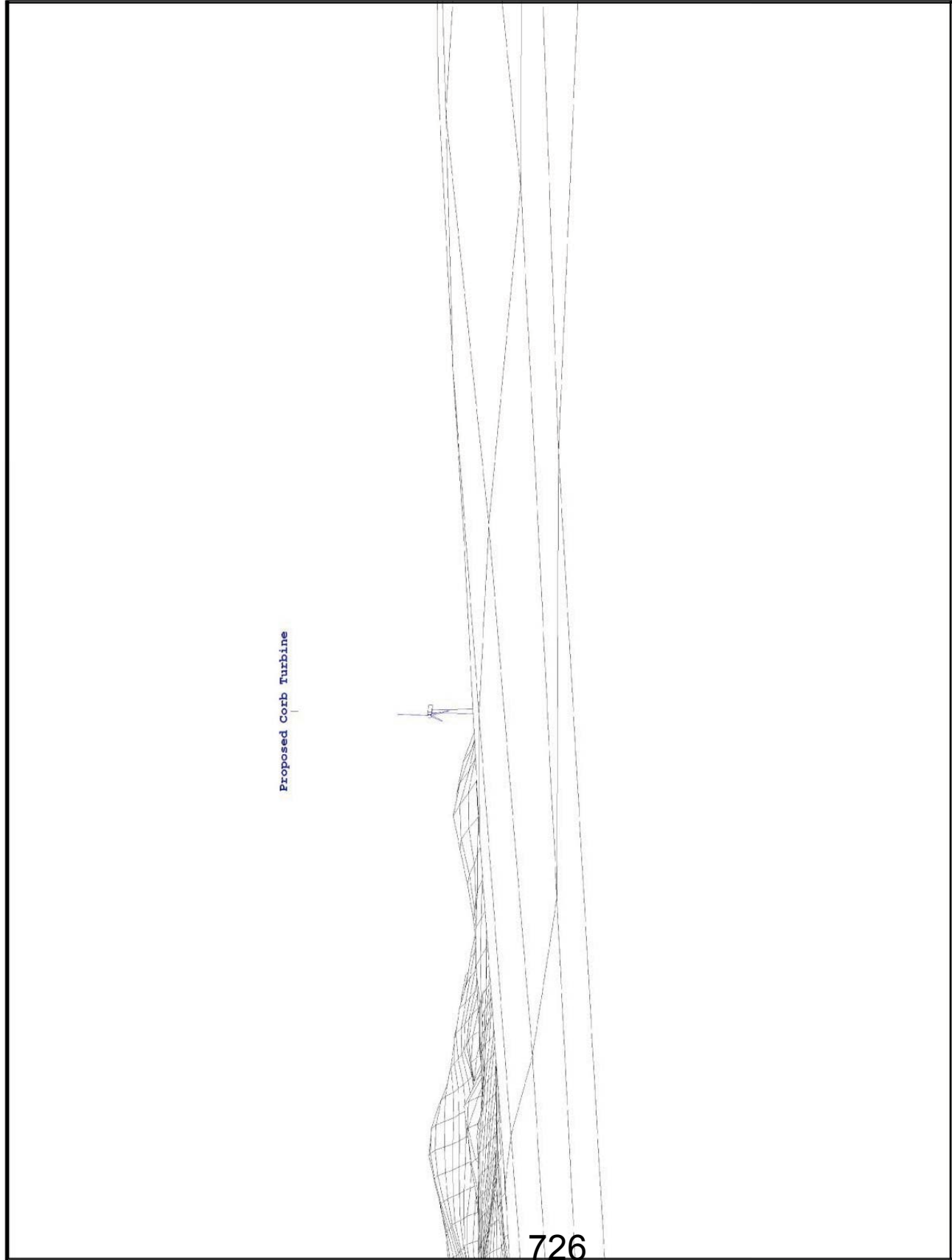
Turbine Details

Model: Gamesa, G58
Hub Height: 55 m
Rotor Diameter: 58 m
Height to Blade Tip: 84 m

Site Name: The Corb
Client: Mr N. Bailey
Site Reference: WV1020
Drawing No: 010a
Date: 04/10/2012
User: chris.lockett



Waterside Farm
Gangneung Road
Gatton KA4 8PB
t: 01563 829959
f: 01563 829383
e: info@v-genealogy.co.uk
w: www.v-genealogy.co.uk



726

Tullymurdoch and Alyth Road at Site Entrance


Recommended Viewing Distance: 500mm

Recommended Viewing Distance: 500mm



Knock of Balmyle Hill

Recommended Viewing Distance: 500mm

<u>Photomontage 2 (Figure 4)</u>	
<u>Viewpoint Details</u>	Viewpoint Location: E312815 N756274 Distance to Proposed Turbine: 3.65 km Ground Height (AOD): 394 m
<u>Photomontage Details</u>	Field of View: 40 degrees Camera Height (AOD): 1.75m Camera: Fujifilm Finepix HS20 EXR Focal Length: 50mm, Full Frame Sensor Date Photograph Taken: 28/09/2012 Time Photograph Taken: 15:30
<u>Turbine Details</u>	Model: Gamesa, G58 Hub Height: 55 m Rotor Diameter: 58 m Height to Blade Tip: 84 m
	Site Name: The Corb Client: Mr N. Bailey Site Reference: WV1020 Drawing No: 011a Date: 04/10/2012 User: chris.lockett
	<div><p>VG ENERGY Renewable Technology Solutions</p></div> <div><p>Blairvale Farm Glasgow Road Glasgow G3 7LH T: 01693 533000 E: info@vgenergy.co.uk W: www.vgenergy.co.uk</p></div>

Wireframe 2a

Viewpoint Details

Viewpoint Location: E312815 N756274
Distance to Proposed Turbine: 3.65 km
Ground Height (AOD): 394 m

Wireframe Details

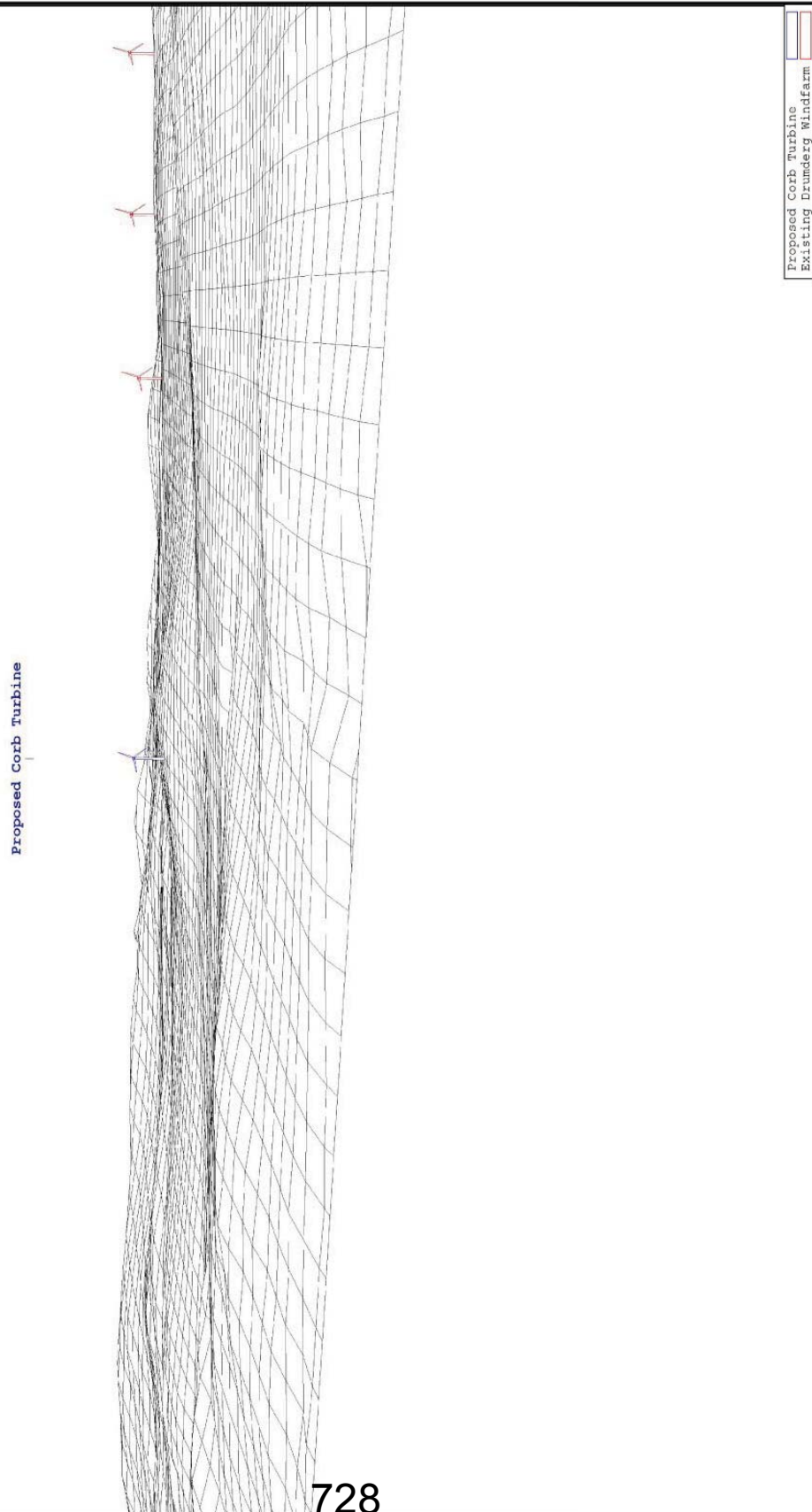
Field of View: 40 degrees
Camera Height (AOD): 1.75m
Camera: Fujifilm Finepix HS20 EXR
Focal Length: 50mm, Full Frame Sensor

Date Photograph Taken: 28/09/2012
Time Photograph Taken: 15:30

Turbine Details

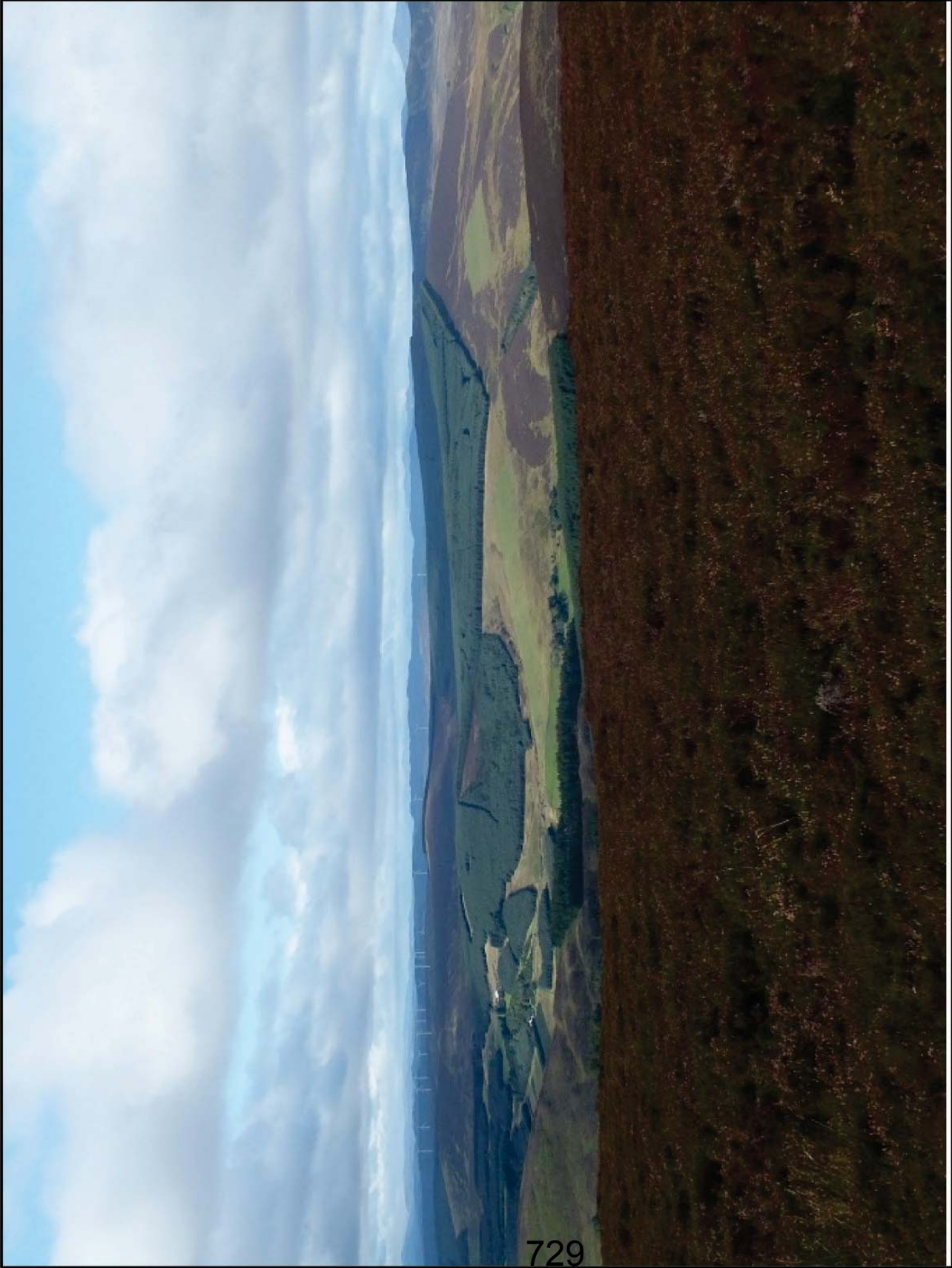
Model: Gamesa, G58
Hub Height: 55 m
Rotor Diameter: 58 m
Height to Blade Tip: 84 m

Site Name: The Corb
Client: Mr N. Bailey
Site Reference: WV1020
Drawing No: 012a
Date: 04/10/2012
User: chris.lockett



Knock of Balmyle Hill

Recommended Viewing Distance: 500mm



729

Creigh Hill by Backwater Reservoir

Recommended Viewing Distance: 500mm

<u>Photomontage 3 (Figure 5)</u>
<u>Viewpoint Details</u> Viewpoint Location: E326419 N758424 Distance to Proposed Turbine: 10.1 km Ground Height (AOD): 497 m
<u>Photomontage Details</u> Field of View: 40 degrees Camera Height (AOD): 1.75m Camera: Fujifilm Finepix HS20 EXR Focal Length: 50mm, Full Frame Sensor Date Photograph Taken: 29/09/2012 Time Photograph Taken: 11:15
<u>Turbine Details</u> Model: Gamesa, G58 Hub Height: 55 m Rotor Diameter: 58 m Height to Blade Tip: 84 m
Site Name: The Corb Client: Mr N. Bailey Site Reference: WV1020 Drawing No: 013a Date: 04/10/2012 User: chris.lockett
<div><div><div>Blanchely Park Glasgow Road Glasgow G4 9LW t: 01693 520000 e: info@vgenergy.co.uk w: www.vgenergy.co.uk</div><div><div>vg</div><div>ENERGY</div><div>Renewable Technology Solutions</div></div></div></div>

Wireframe 3a

Viewpoint Details

Viewpoint Location: E326419 N758424
 Distance to Proposed Turbine: 10.1 km
 Ground Height (AOD): 497 m

Viewpoint Location: E326419 N758424
Distance to Proposed Turbine: 10.1 km
Ground Height (AOD): 497 m

Wireframe Details

Field of View: 40 degrees
Camera Height (AOD): 1.75m
Camera: Fujifilm Finepix HS20 EXR
Focal Length: 50mm, Full Frame Sensor

Date Photograph Taken: 29/09/2012
Time Photograph Taken: 11:15

Field of View: 40 degrees
Camera Height (AOD): 1.75m
Camera: Fujifilm Finepix HS20 EXR
Focal Length: 50mm, Full Frame Sensor

Date Photograph Taken: 29/09/2012
Time Photograph Taken: 11:15

Turbine Details

Model: Gamesa, G58
Hub Height: 55 m
Rotor Diameter: 58 m
Height to Blade Tip: 84 m

Site Name: The Corb
Client: Mr N. Bailey
Site Reference: WV1020
Drawing No: 014a
Date: 04/10/2012
User: chris.lockett



Waterside Farm
Gangneung Road
Gatton KA4 8PB
t: 01563 829959
f: 01563 829383
e: info@v-genealogy.co.uk
w: www.v-genealogy.co.uk

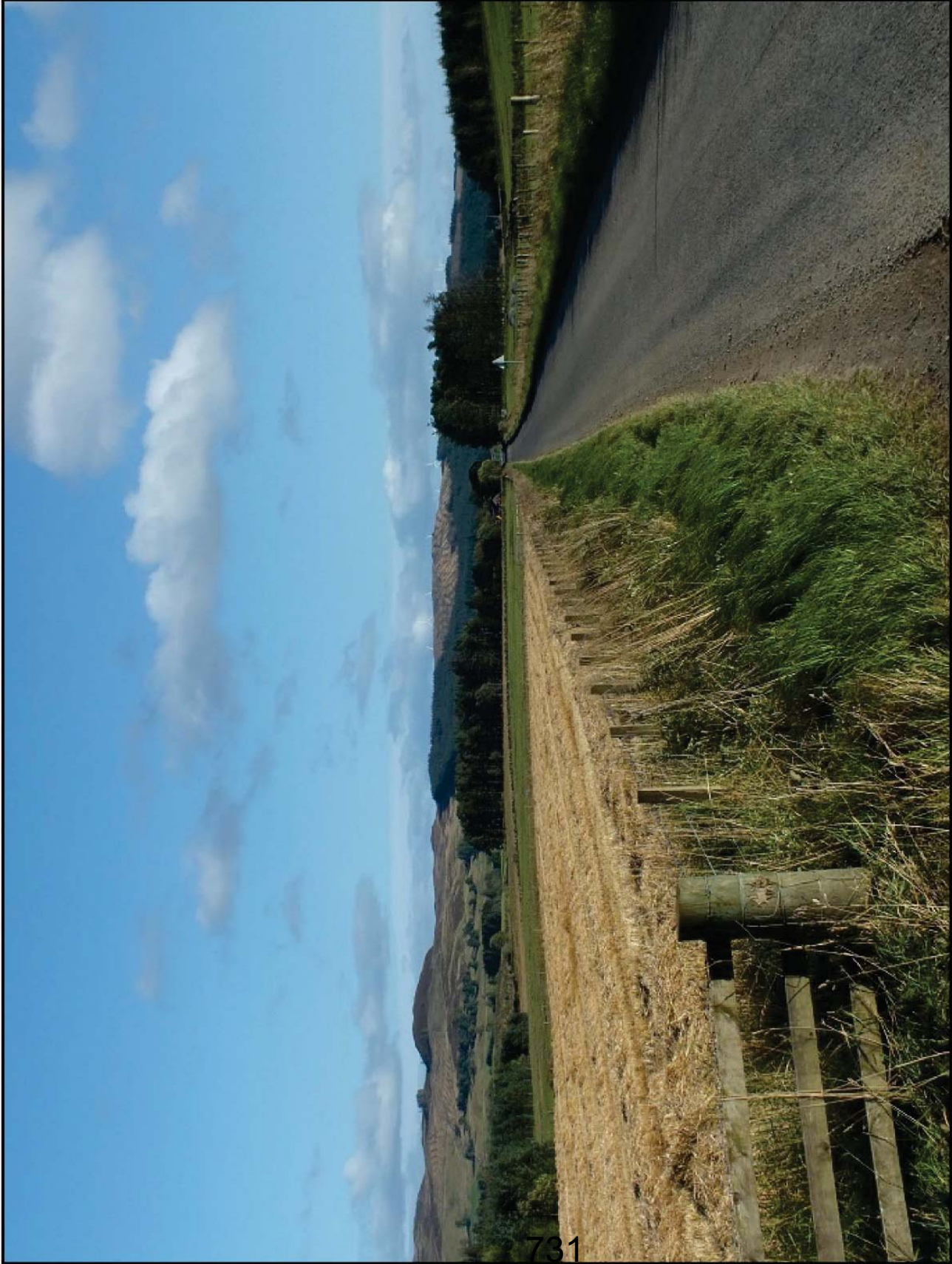


Proposed Corb Turbine	Existing Drumberg Windfarm

Creigh Hill by Backwater Reservoir

Recommended Viewing Distance: 500mm

Recommended Viewing Distance: 500mm



B950 Pitlochry Road

Recommended Viewing Distance: 500mm

Photomontage 4 (Figure 6)

Viewpoint Details

Viewpoint Location: E311774 N759857
Distance to Proposed Turbine: 5.4 km
Ground Height (AOD): 269 m

Photomontage Details

Field of View: 40 degrees
Camera Height (AOD): 1.75m
Camera: Fujifilm Finepix HS20 EXR
Focal Length: 50mm, Full Frame Sensor
Date Photograph Taken: 30/09/2012
Time Photograph Taken: 16:15

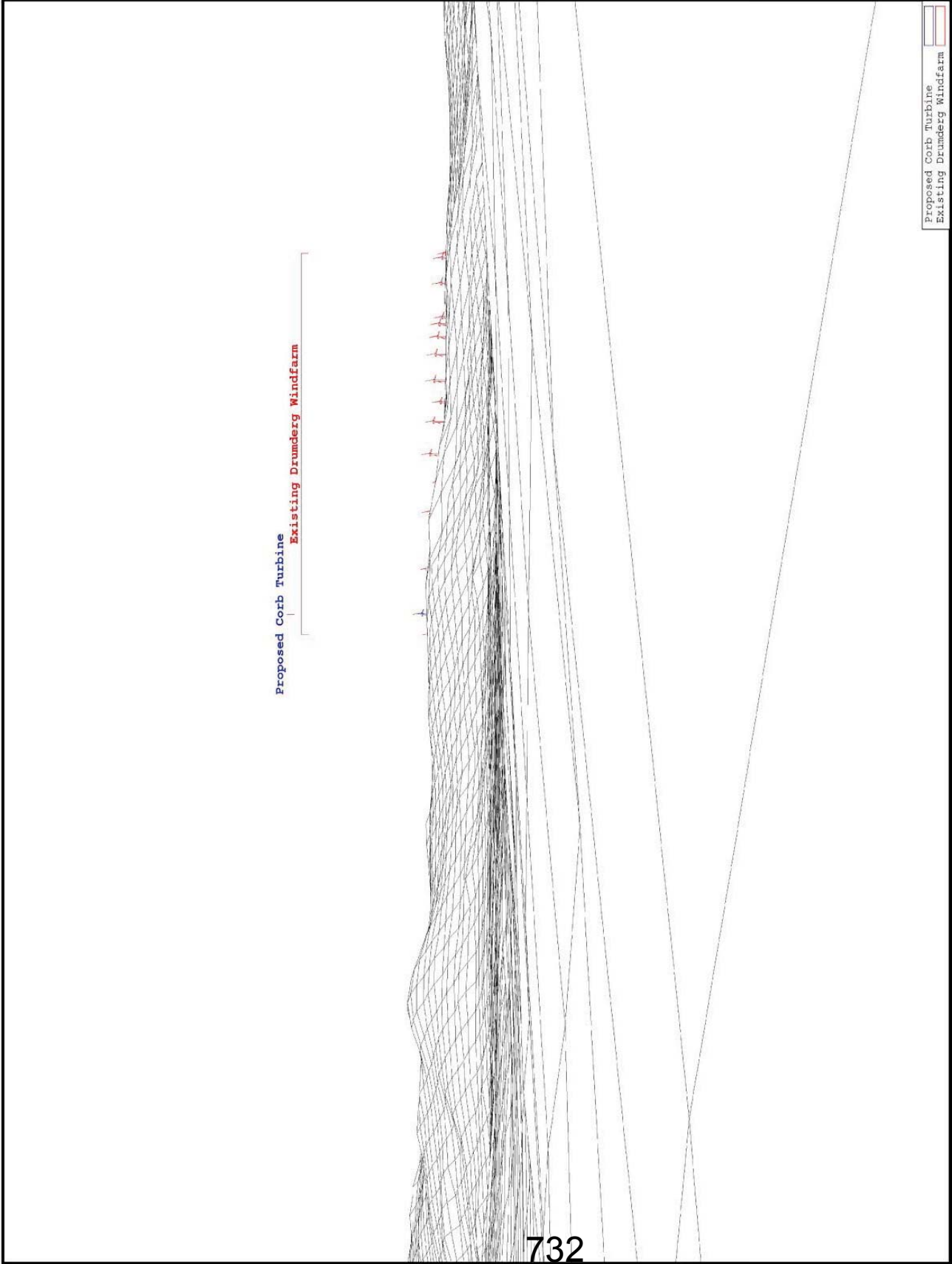
Turbine Details


Model: Gamesa, G58
Hub Height: 55 m
Rotor Diameter: 58 m
Height to Blade Tip: 84 m

Site Name: The Corb
Client: Mr N. Bailey
Site Reference: WV1020
Drawing No: 015a
Date: 05/10/2012
User: chris.lockett



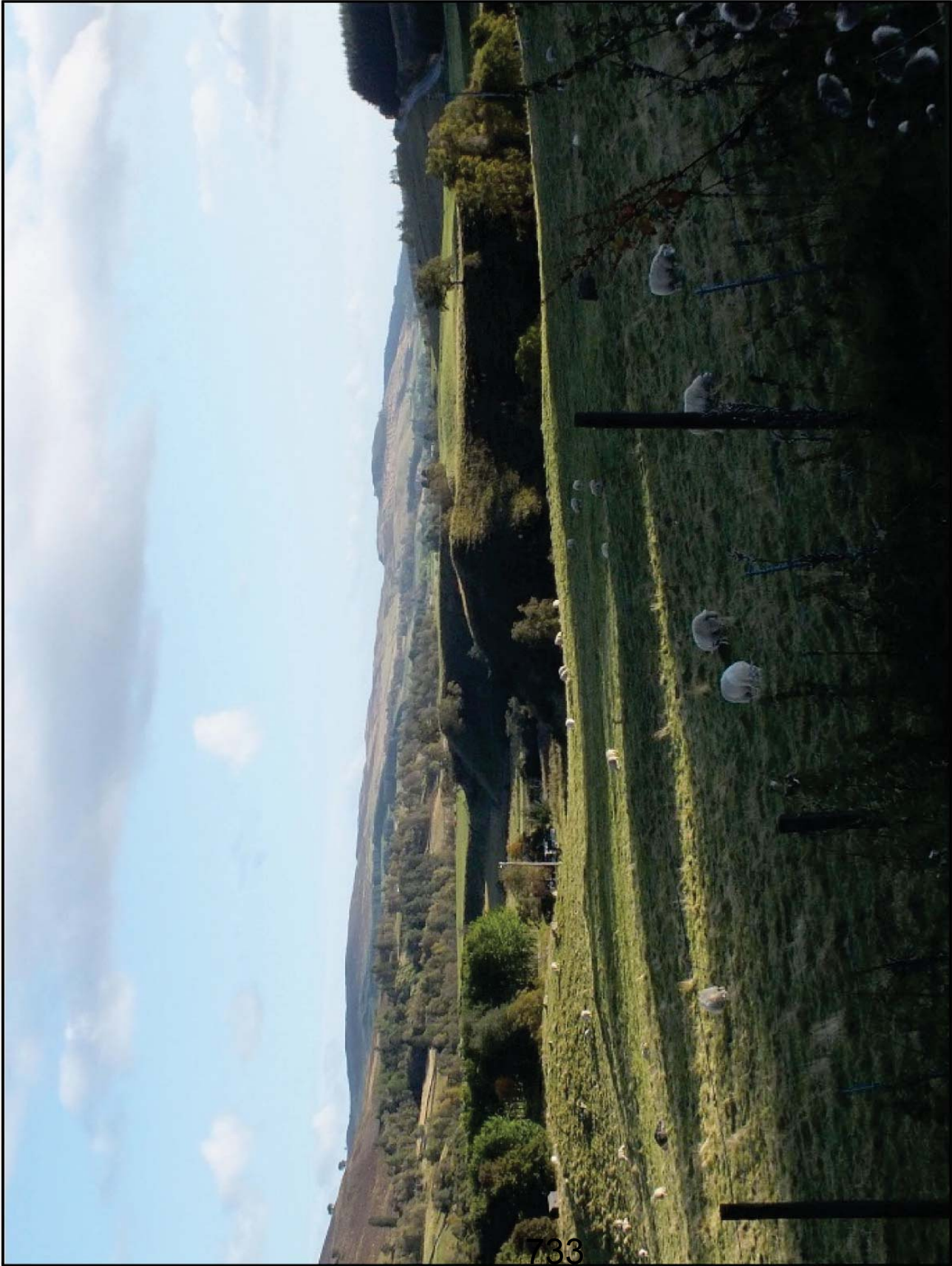
Blairgowrie Park
Glasgow Road
Blairgowrie
Perth & Kinross
T: 01569 520000
F: 01569 520001
W: www.vgenergy.co.uk



<u>Wireframe 4a</u>	
<u>Viewpoint Details</u>	Viewpoint Location: E311774 N759857 Distance to Proposed Turbine: 5.4 km Ground Height (AOD): 269 m
<u>Wireframe Details</u>	Field of View: 40 degrees Camera Height (AOD): 1.75m Camera: Fujifilm Finepix HS20 EXR Focal Length: 50mm, Full Frame Sensor Date Photograph Taken: 30/09/2012 Time Photograph Taken: 16:15
<u>Turbine Details</u>	Model: Gamesa, G58 Hub Height: 55 m Rotor Diameter: 58 m Height to Blade Tip: 84 m
	Site Name: The Corb Client: Mr N. Bailey Site Reference: WV1020 Drawing No: 016a Date: 05/10/2012 User: chris.lockett
	 VG ENERGY Renewable Technology Solutions <small>Blairholm Park Glasgow Road Glasgow G3 7NF T: 01693 539000 F: 01693 539009 W: www.vgenergy.co.uk</small>


B950 Pitlochry Road

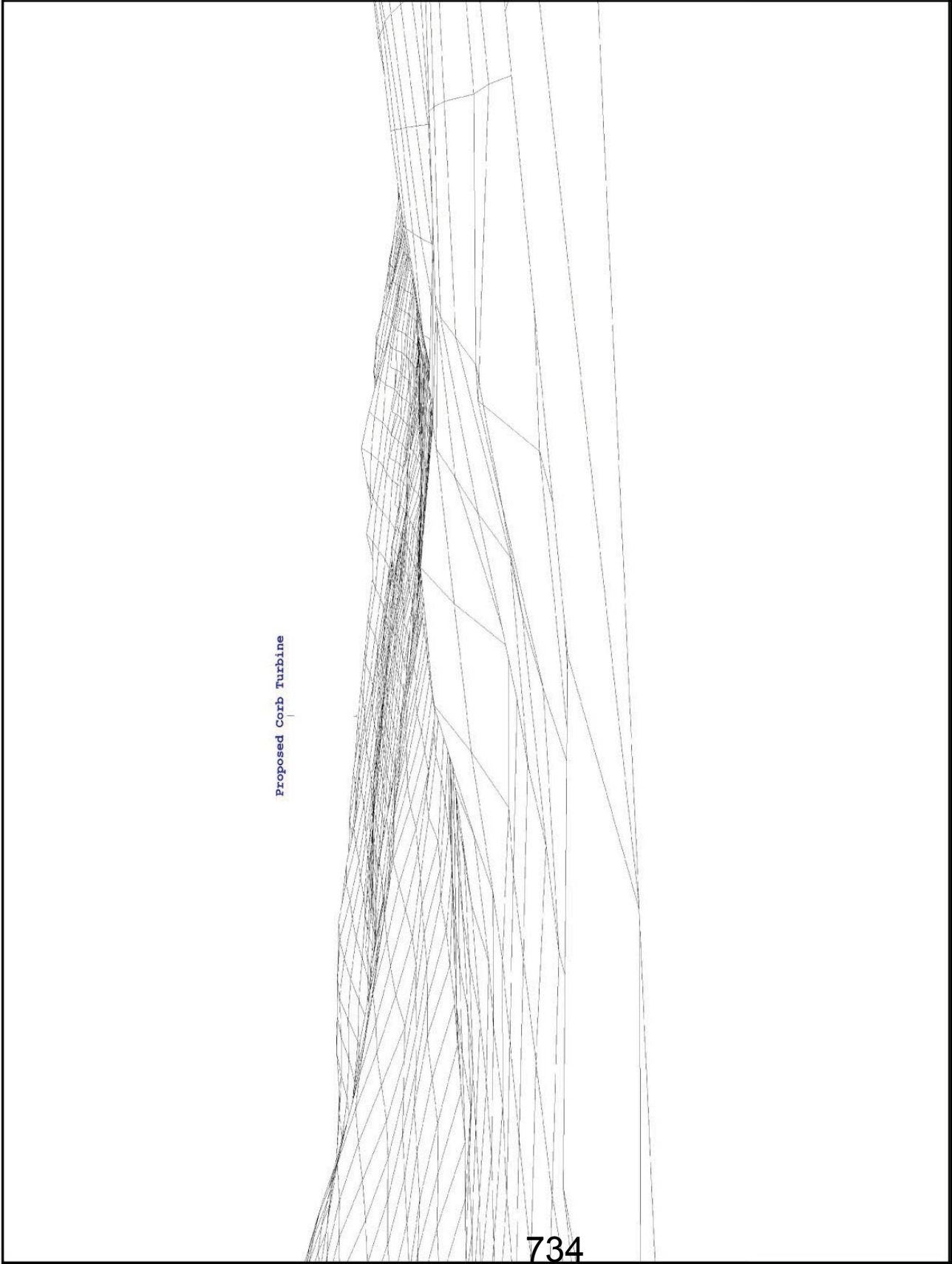
Recommended Viewing Distance: 500mm



A93 at Glenshee Pottery

Recommended Viewing Distance: 500mm

<u>Photomontage 5 (Figure 7)</u>	
<u>Viewpoint Details</u> Viewpoint Location: E314260 N763487 Distance to Proposed Turbine: 6.78 km Ground Height (AOD): 326 m	
<u>Photomontage Details</u> Field of View: 40 degrees Camera Height (AOD): 1.75m Camera: Fujifilm Finepix HS20 EXR Focal Length: 50mm, Full Frame Sensor Date Photograph Taken: 30/09/2012 Time Photograph Taken: 17:00	
<u>Turbine Details</u> Model: Gamesa, G58 Hub Height: 55 m Rotor Diameter: 58 m Height to Blade Tip: 84 m	
Site Name: The Corb Client: Mr N. Bailey Site Reference: WV1020 Drawing No: 017a Date: 05/10/2012 User: chris.lockett	
<div><p>Glenshee Pottery Glenshee Road Glenshee, Perthshire PH15 2JG T: 01563 520000 F: 01563 520001 W: www.vgenergy.co.uk</p></div>	



734

A93 at Glenshee Pottery

Recommended Viewing Distance: 500mm

<u>Wireframe 5a</u>	
<u>Viewpoint Details</u>	Viewpoint Location: E314260 N763487 Distance to Proposed Turbine: 6.78 km Ground Height (AOD): 326 m
<u>Wireframe Details</u>	Field of View: 40 degrees Camera Height (AOD): 1.75m Camera: Fujifilm Finepix HS20 EXR Focal Length: 50mm, Full Frame Sensor Date Photograph Taken: 30/09/2012 Time Photograph Taken: 17:00
<u>Turbine Details</u>	Model: Gamesa, G58 Hub Height: 55 m Rotor Diameter: 58 m Height to Blade Tip: 84 m
	Site Name: The Corb Client: Mr N. Bailey Site Reference: WV1020 Drawing No: 018a Date: 05/10/2012 User: chris.lockett
	<div><div><div>Glenshee Pottery Glenshee Road Glenshee, Perth T: 01563 533000 F: 01563 533009 W: www.glensheepottery.co.uk</div><div><div>VG</div><div>ENERGY</div><div>Renewable Technology Solutions</div></div></div></div>

Figure 8: Wind Farm Developments within 35km of The Corb, Bridge of Cally

Legend:



(Project Name) Turbine Location
E316389 N757051



Installed



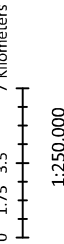
Approved



Application



Scoping



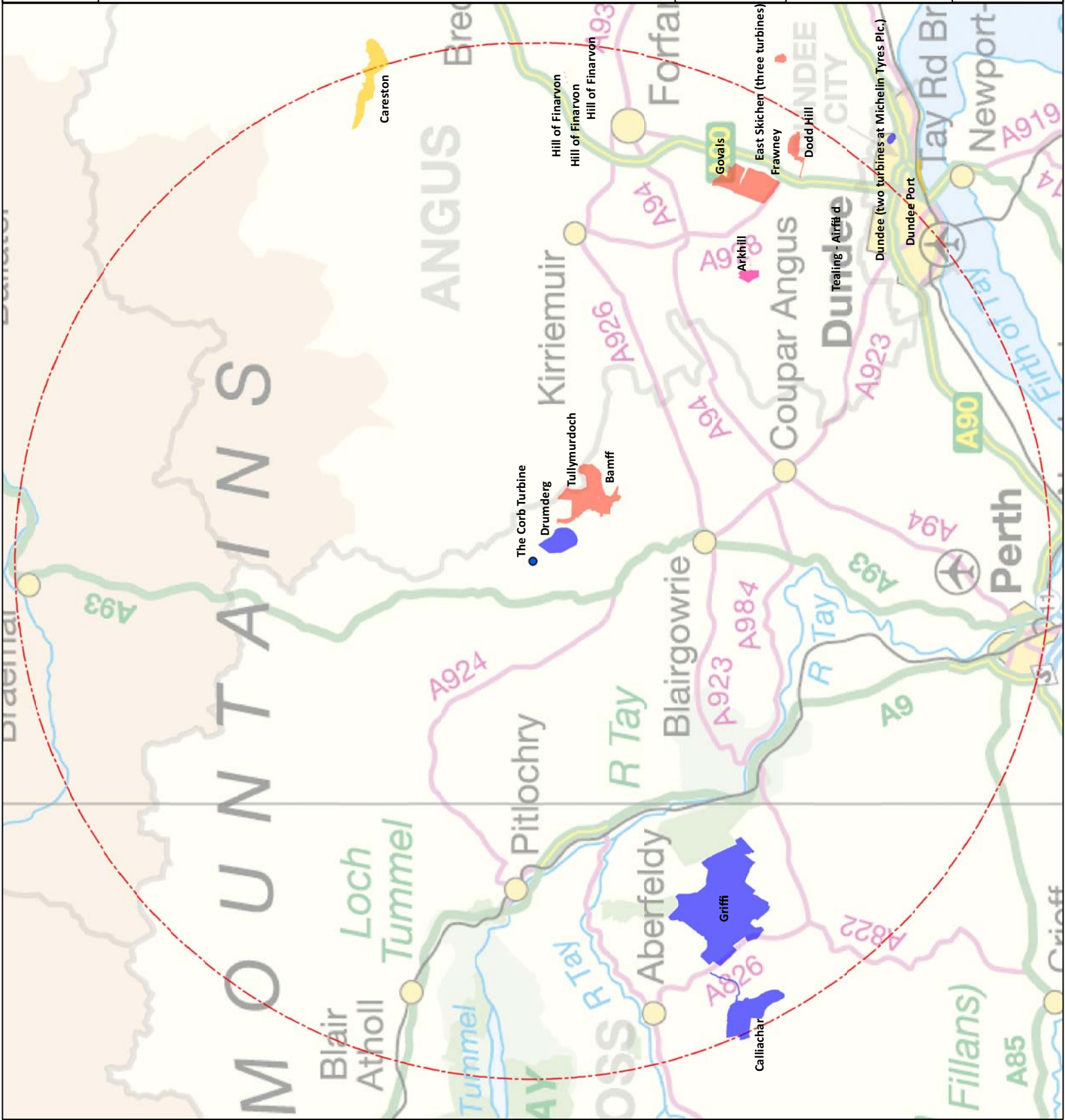
Ordnance Survey © Crown Copyright 2012.
All rights reserved. Licence number 100020449

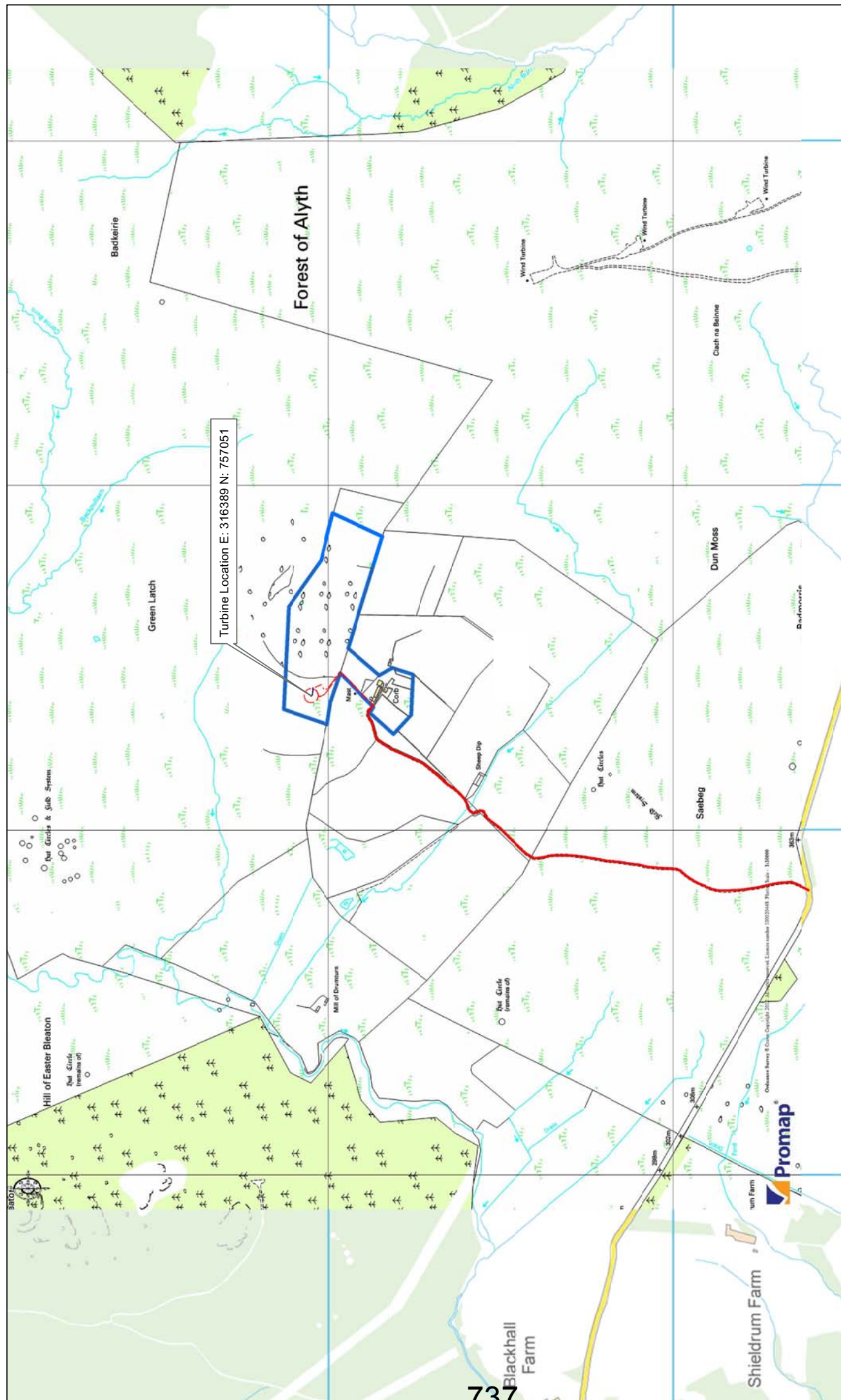


Site Name: The Corb
Client: Mr. N. Bailey
Site Reference: WV1020
Drawing No: 007a
Date: 26/10/2012
Drawn by: chris.lockett



Waterside Farm
Glasgow Road
Glasgow G3 7JH
t 01693 829898
f 01693 829883
w www.vgenergy.co.uk





Site Map for The Corb, Bridge of Cally, PH10 7JX



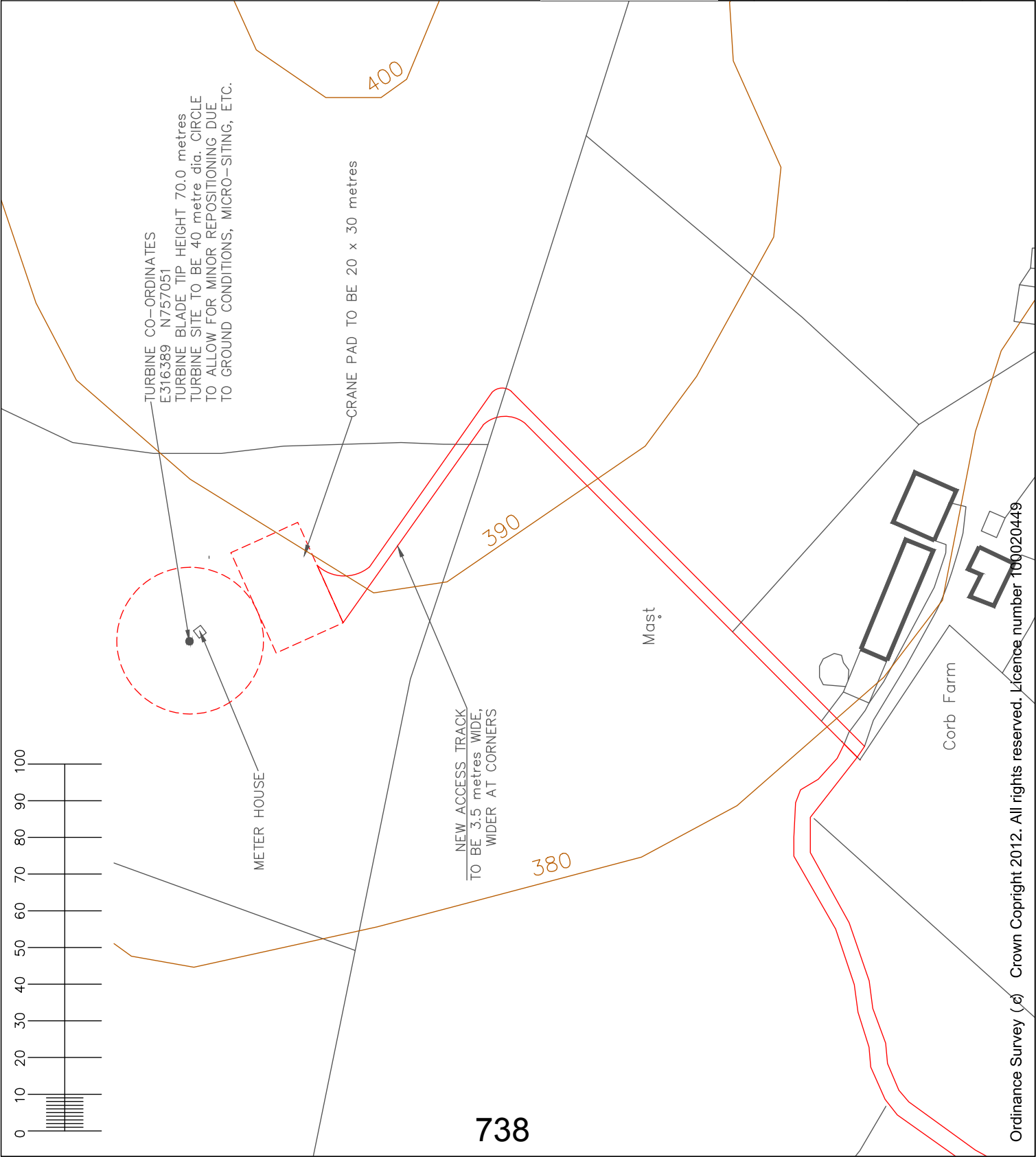
Ordnance Survey © Crown Copyright 2012. All rights reserved. Licence number 100020449



Legend

— Access Track

Land Boundary



738

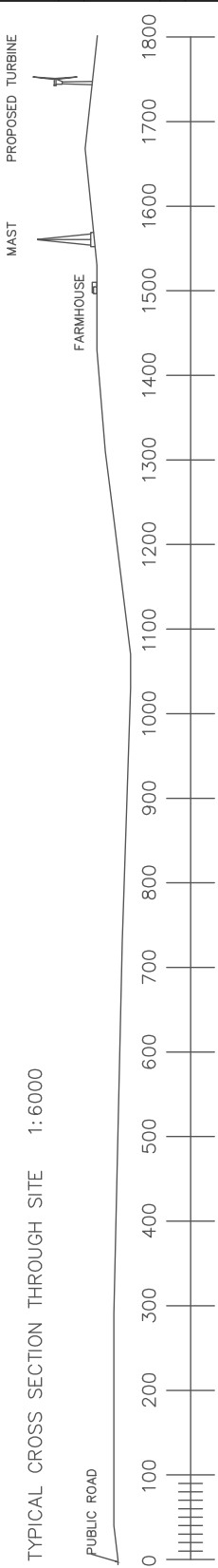
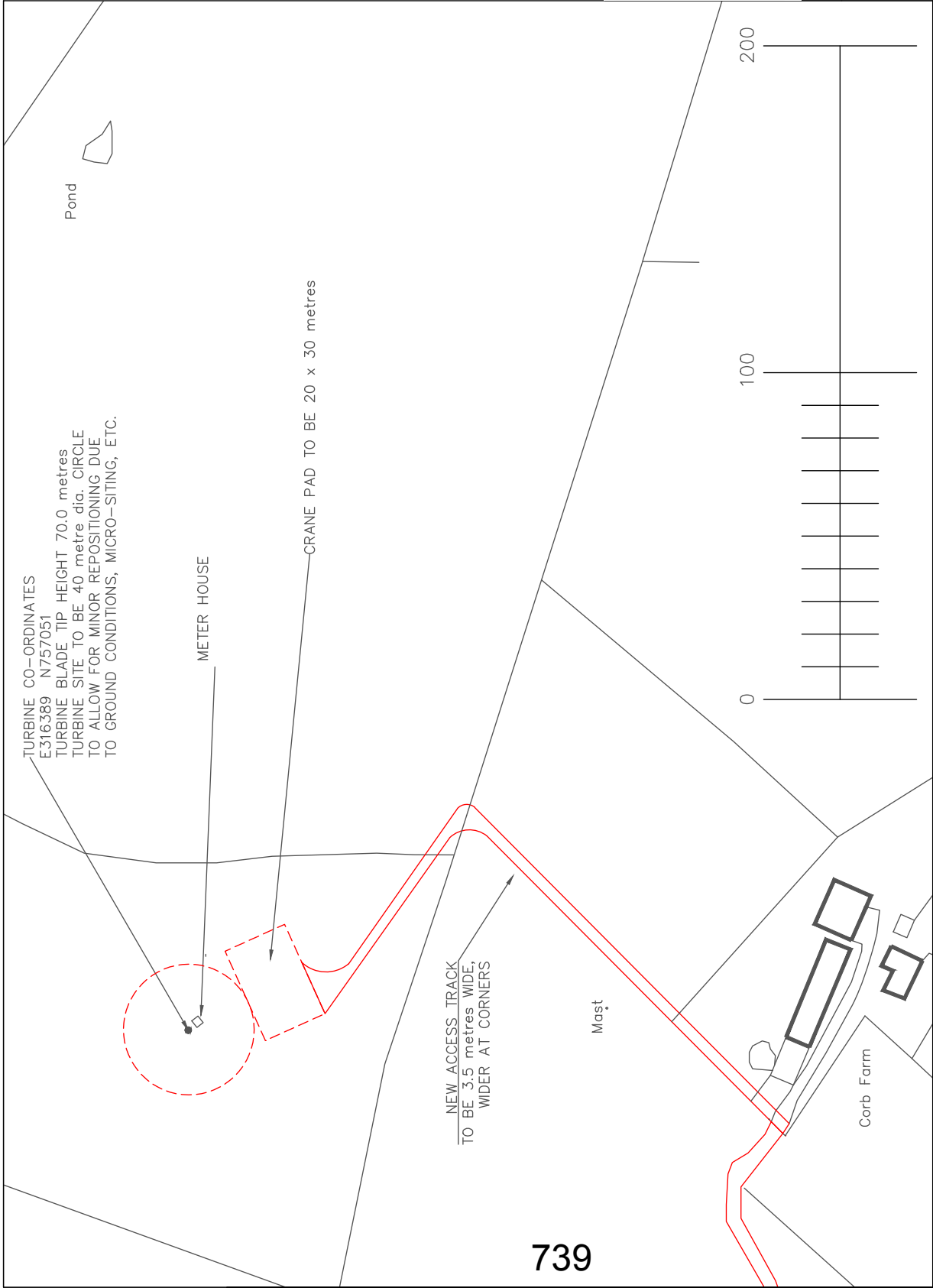


Waterside Farm
Glasgow Road
Gallatin
KA4 8PB
t: 01563 829990
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk

PROJECT

PROPOSED ERECTION OF A 44 metre
GAMESA WIND TURBINE for MR BAILEY
at THE CORB FARM,
GLENSHEE, PH10 7JX

DRAWING NO.	REVISION
A003	
SCALE	DATE
1:1000	05/09/2012





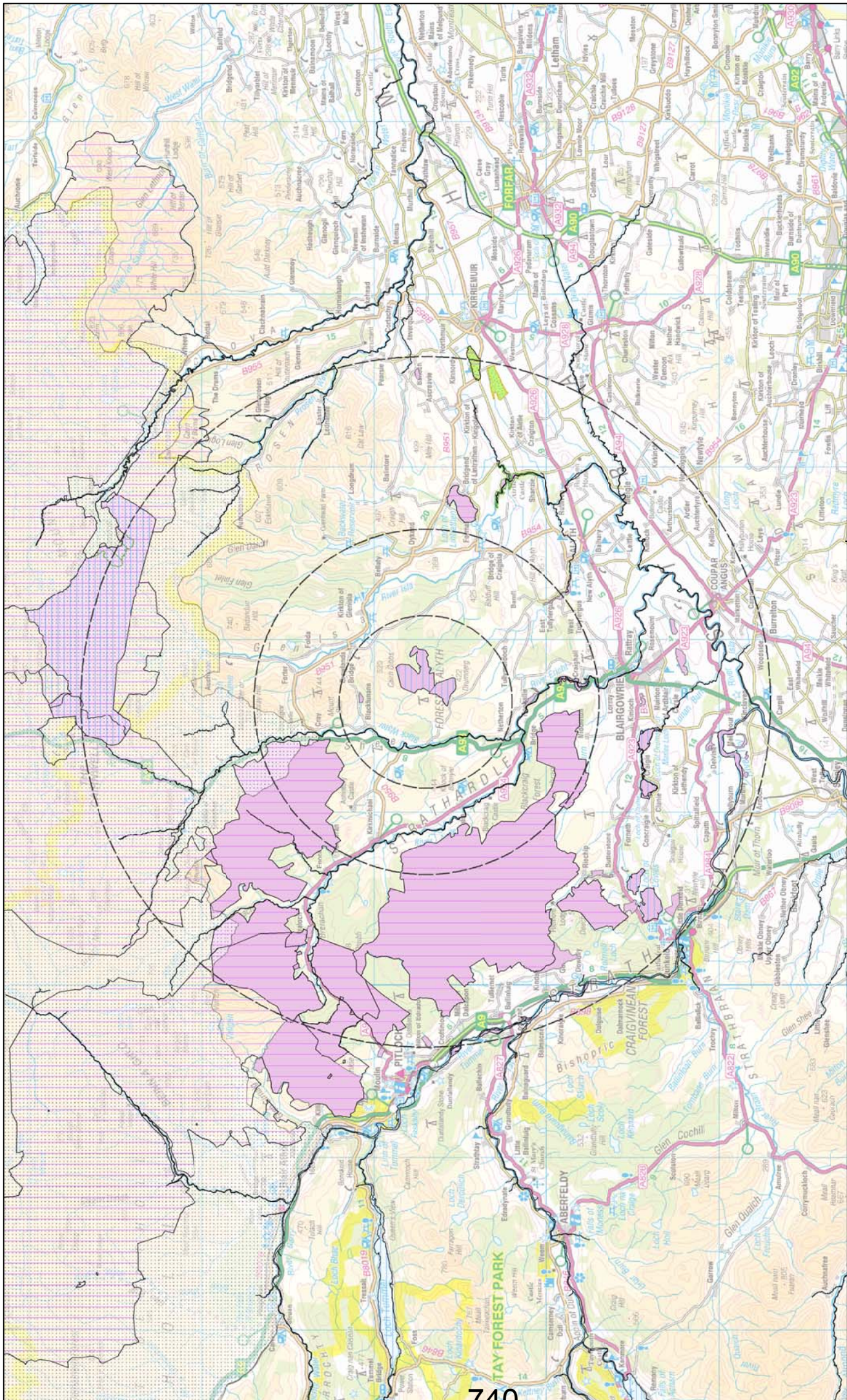
Renewable Technology Specialists

Waterside Farm
Glasgow Road
Galsgow
KA4 8PB
t: 01563 829990
f: 01563 829383
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk

PROJECT

PROPOSED ERECTION OF A 44 metre
GAMESA WIND TURBINE for MR BAILEY
at THE CORB FARM,
GLENSHEE, PH10 7JX

DRAWING NO.	REVISION
A001	
SCALE	DATE
1:1250	05/09/2012



Environmental Sites within 20km of The Corb

Date: 17/08/2012

1:200,000

19 Kilometers

0 4.75 9.5

N

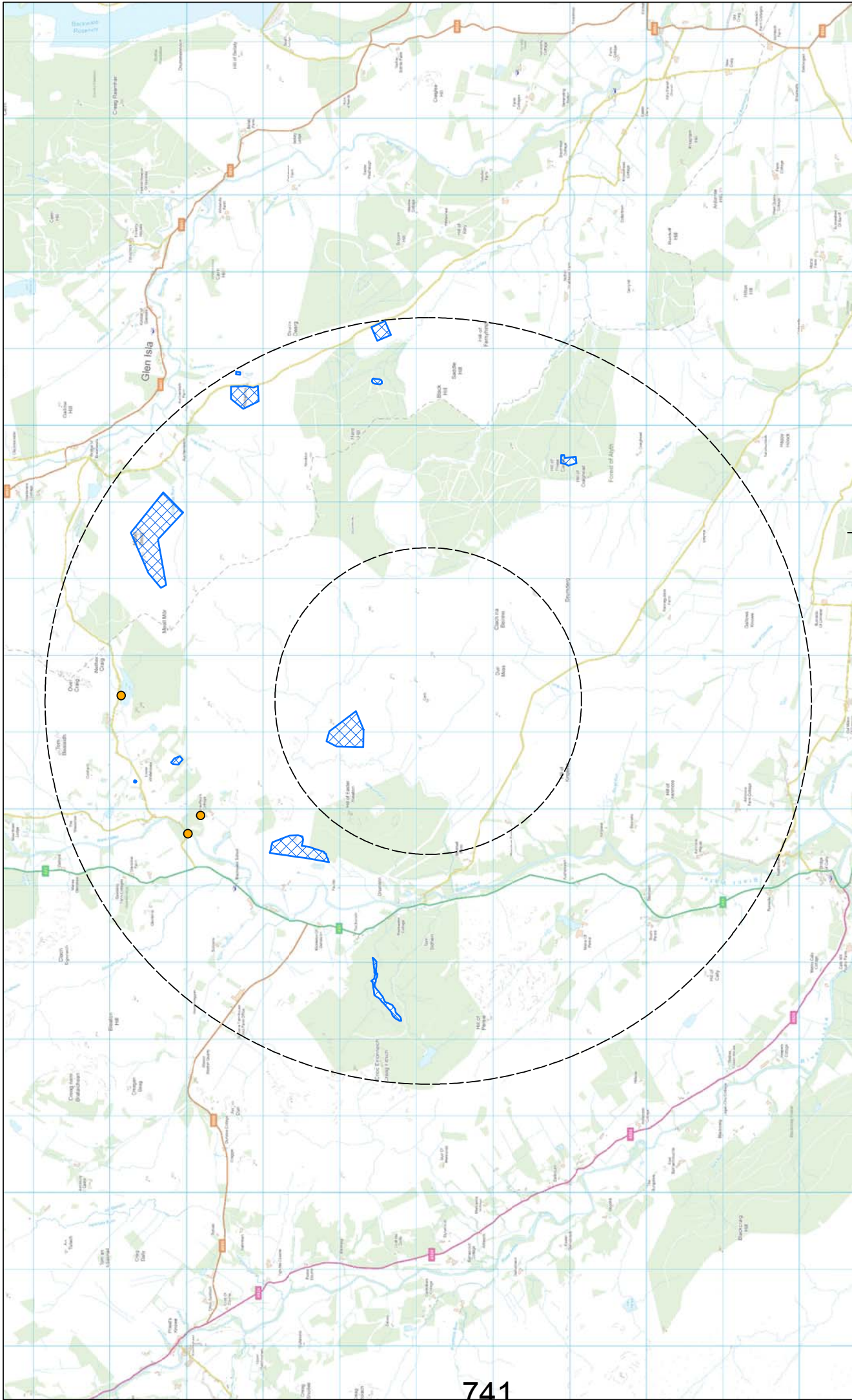
Ordnance Survey © Crown Copyright 2012. All rights reserved. Licence number 100020449

Legend

- 5, 10 and 20km Circles
- National Parks
- Special Protection Areas
- RSPB Reserves
- Special Areas of Conservation
- SSSI's
- National Nature Reserves

VG ENERGY

Renewable technology Specialists



The Corb Archaeology and Cultural Heritage Map

1:45,000

4 Kilometers

0 1 2

N

Legend

2 & 5km Circles

Scheduled Ancient Monuments


Listed Buildings

Category

A ●

B ●

Ordnance Survey(c) Crown Copyright 2011. All rights reserved. Licence number 100020449

	ENGINEERING COORDINATION MEMORANDUM	F11-12-ECM138 Edition 0	
		DATE 29/03/2012	Página (Page): 1 de (of): 19
FROM: WFP FAX: PHONE:	TO: VG Energy FAX: PHONE:	PROGRAMA: FOCAL POINT: PCUENCA CC: JSTOREY	
SUBJECT: <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>			
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			

1. AIM

This document performs a one-third octave band spectral analysis of the noise for G5X turbines. This study shall be performed based on the noise measurement reports prepared by accredited centers, WINDTEST, DEWI, and internal reports available in the Gamesa Innovation and Technology database.

Based on the analysis of the one-third octave-band noise measurements, a model shall be defined for G52, G58 wind turbines that is independent to the measurement parameters.

The noise emissions of the G8X group of wind turbines measured by the accredited centers, were made in line with the IEC61400-11 standard, considering, as indicated, sound pressure levels in the interval of speeds from 6 to 10m/s.


2. SCOPE

This document applies to G5X wind turbines. The spectral noise distribution is the same for all the noise levels, changing only the amplitude or noise level (WLL) for different operating conditions. Therefore, the procedure and the models presented in this report apply to any noise level and wind speed.

Due to the uncertainty in the measurements and the fact that the models proposed here are based on experimental data, it is not possible to guarantee the accuracy of these models. They must be interpreted as an approximation and not as a prediction of the spectral noise distribution produced by the wind turbine.

3. DEFINITIONS AND ACRONYMS

WT: Wind turbine.

	ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 2 de (of): 19
This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

4. DESCRIPTION

The procedure proposed in this report consists of reducing the number of variables on which the noise depends (turbine operating state, density, turbulence intensity, rotation speed, etc.) to facilitate the analysis of all the available noise spectra. The method to follow in all the reports for G8X wind turbines is to standardize all the spectra in third octaves at a reference noise level, $L_{Aeq,ref}$, of **100dB(A)**. For this purpose, the amplitude, or noise level, of each third octave is standardized according to the following expression:

$$\bar{L}_{Aeq,i} = \bar{L}_{Aeq,i}^0 + (\bar{L}_{Aeq,ref} - \bar{L}_{Aeq,total \text{ espectro}}) \quad [1]$$


Where:

$\bar{L}_{Aeq,i}$ = standardized noise level, where i is the nominal frequency in third octaves [Hz].

$L_{Aeq,i}^0$ = noise level of the spectrum at the frequency i

$L_{Aeq,ref}$ = reference noise level 100dB

$L_{Aeq,total \text{ espectro}}$ = total noise level of the spectrum

	ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 3 de (of): 19
This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

The total noise level of the spectrum once standardized is 100dB(A). This allows us to compare the distribution in frequencies of turbines that produce a different noise level. With this comparison you can establish a trend, and associate a spectral distribution to a type of turbine. Once this is completed, to recover or to calculate the sound power distribution for a turbine or certain noise level, it is only necessary to do the standardization operation in reverse order.

To transfer the standardized noise spectra to 100 dB(A) to the turbine noise levels, it is necessary do the standardization operation in reverse order. For this purpose, you just need to add the difference between the noise level for which you wish to know the spectrum distribution to each value of the standardized spectrum and the 100 dB(A) to the that have been standardized:

$$\bar{L}_{Aeq,i}^0 = \bar{L}_{Aeq,i} + (\bar{L}_{Aeq,total\ espectro} - \bar{L}_{Aeq,ref}) \quad [2]$$


To calculate the distribution in frequencies of the noise produced by a turbine, you need to know the control law that has been applied to the turbine. The wind speed and the noise produced by the wind turbine are related by these control laws. These laws are shown in **Appendix A** for the G52 and G58 models for different tower heights.

The procedure for calculating the sound spectrum of a turbine in certain conditions consists in obtaining, from the table corresponding to the tower height and to the control law, the noise level for the desired wind speed. Once you have this value, the standardized spectrum of the wind turbine model is displaced using **[2]**.

Appendix B includes a demonstrative example.

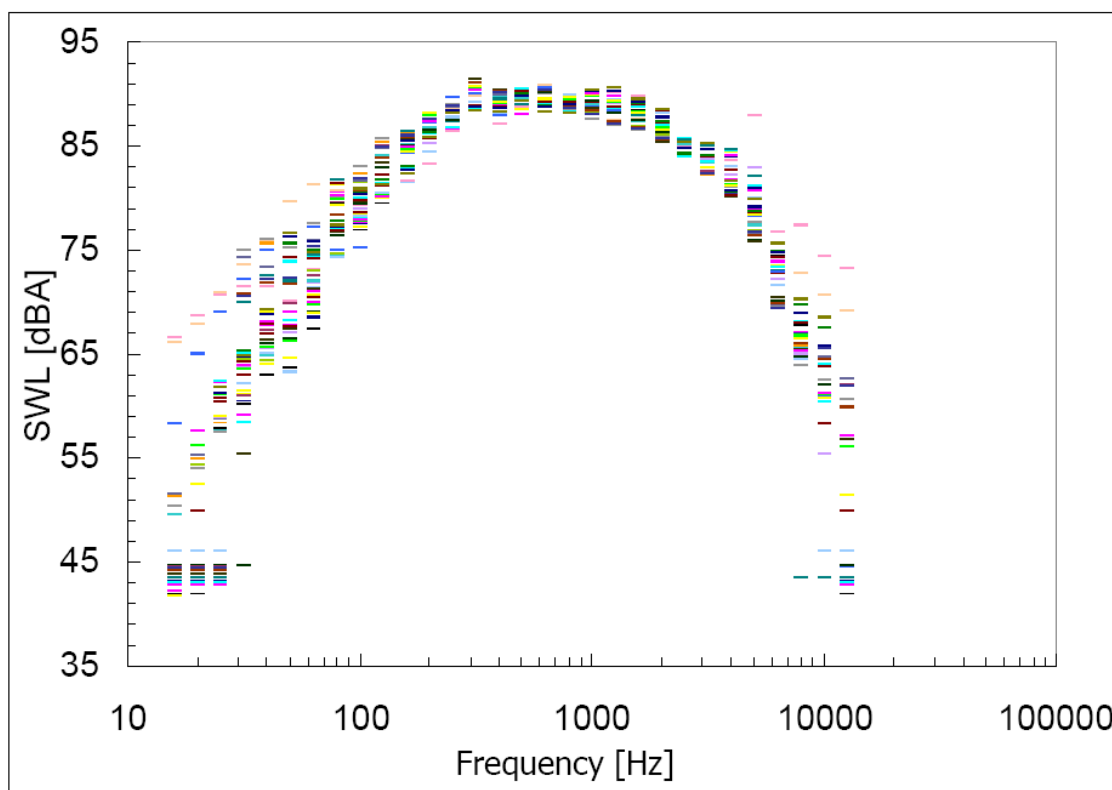
5. STANDARDIZED OCTAVE SPECTRA AT 100DB FOR G5X WT

Below are the one-third octave-band noise emission spectra measured for G5X turbines. These spectra have been standardized to a noise level of 100dB(A) according to the expression **[1]**.


		ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 4 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

5.1. NOISE REPORTS FOR WT 52

The noise spectra analyzed for the G52 wind turbine in standardized third octaves are included in the reports [re.3] and are shown in Graph 1.

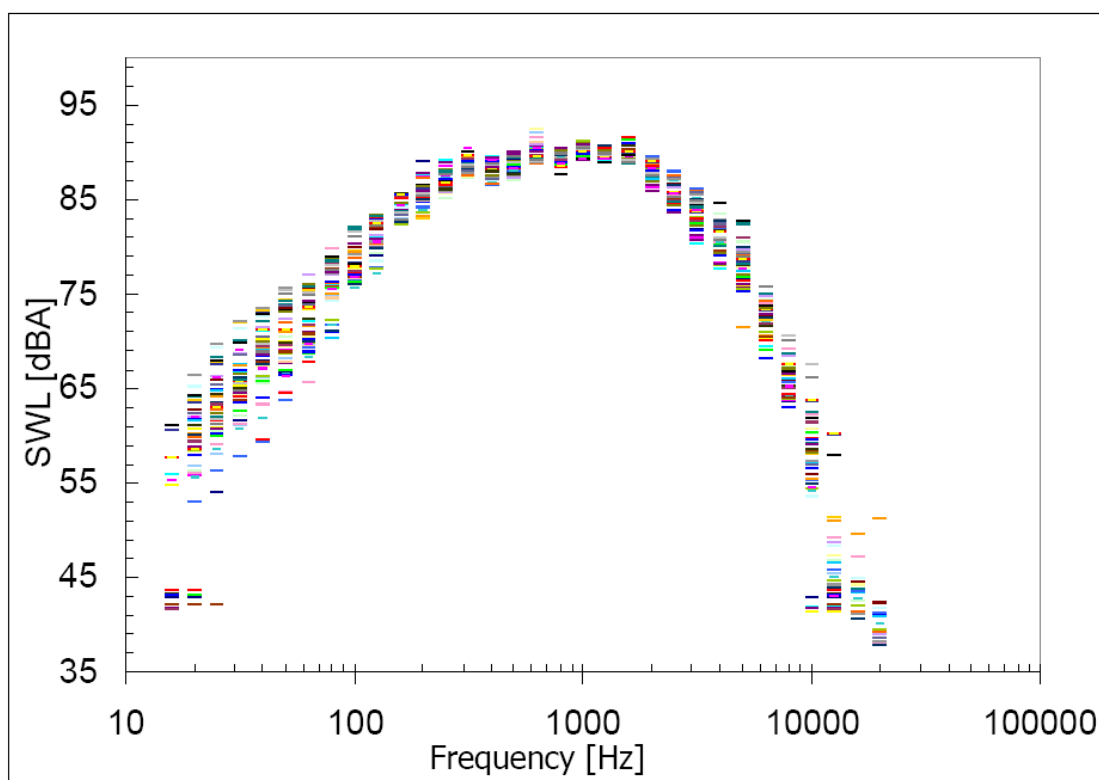


Graph 1: Standardized one-third octave-band spectra at 100dB measured by accredited centers.


		ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 5 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

5.2. NOISE REPORTS FOR WT 58

The standardized one-third octave-band noise spectra analyzed for the G58 wind turbine are included in the reports [ref.4] and are shown in Graph 2.



Graph 2: Spectra in standardized third octaves at 100dB measured by accredited centers for the G58.

	ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12 Página (Page): 6 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

6. GNOISE MODEL

The semi-empirical model Gnoise is based on establishing four sources of aerodynamic noise

- Noise produced by the turbulence of the incident current.
- Noise due to the thickness of the trailing edge.
- Noise due to the interference of the limit layer with the trailing edge.
- Noise produced by the blade tip vortex.

Below, the aforementioned generation mechanisms are shown schematically.


NOISE PRODUCED BY THE TURBULENCE OF THE INCIDENT CURRENT.

When the blades of the wind turbine rotate they encounter atmospheric turbulence that causes variations in the local angle of attack, which causes fluctuations in the lift and resistance forces. The correlation that provides the Sound Pressure Level is:

$$SPL_{1/3}(f) = 10 \log_{10} \left[\frac{B \sin^2 \theta \rho^2 c_{0.7} R \sigma^2 V_{0.7}^4}{d^2 a_0^2} \right] + K_a$$

$$V_{0.7} = 0.7 R \Omega$$

$$f_{peak} = \frac{S_0 V_{0.7}}{H - 0.7 R}$$

	ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 7 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

Where

$SPL_{1/3}$ = sound pressure level in third octave bands (dB)

f = central frequency of the band (Hz)

B = number of blades

θ = angle between the center line of the rotor-receptor and its vertical projection on the rotor drawing (rad)

ρ = air density (kg/m^3)

$c_{0.7}$ = rope in the radius 0.7R (m)

σ^2 = average quadratic turbulence (m^2/s^2)


$v_{0.7}$ = effective speed in 0.7R (m/s)

K_c = scale factor depending on the frequency (dB)

f_{peak} = frequency for K_a maximum (Hz)

S_0 = Strouhal constant number = 16.6

H = height of the tower (m)

	ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 8 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

NOISE DUE TO THE THICKNESS OF THE TRAILING EDGE

Another source of aerodynamic noise to be taken into account is the creation of vortices due to the fact that the trailing edge is blunt. The expression derived from the literature is:

$$SPL_{1/3}(f) = 10 \log_{10} \sum_{nstac} \frac{B dr V_r^{5.3} t \sin^2(\theta/2) \sin^2 \psi}{(1 + M \cos \theta)^3 (1 + 0.2 M \cos \theta)^2 d^2} 10^{\frac{K_c}{10}}$$

$$f_{peak} = \frac{0.1 V_r}{t}$$

$$M = \frac{V_r}{a_0}$$


Where

M= Mach number of each blade station

dr= differential of r belonging to each station (m)

ψ = angle between the center line of the rotor-receptor and its horizontal projection on the rotor drawing (rad)

t= thickness of the trailing edge (m)

	ENGINEERING COORDINATION MEMORANDUM		ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12	
		Página (Page): 9 de (of): 19	
This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

$$D = \frac{\sin^2(\theta/2)}{(1 + M \cos \theta)(1 + 0.2M \cos \theta)}; \delta = \frac{0.37c}{N_R^{0.2}}; N_R = \frac{V_r c}{\nu}; S = \frac{f\delta}{V_r}$$

Where

D= directivity factor

δ = thickness of the limit layer

c= rope of each of the blade stations

N_r = Reynolds number of each of the stations

ν = cinematic viscosity (m^2/s)

S= Strouhal number of each station

$S_{max}=0.1$


K_b = constant scale factor = 5.5 dB

NOISE PRODUCED BY THE BLADE TIP VORTEX

The expression that provides the sound pressure level produced by the blade tip vortex is:

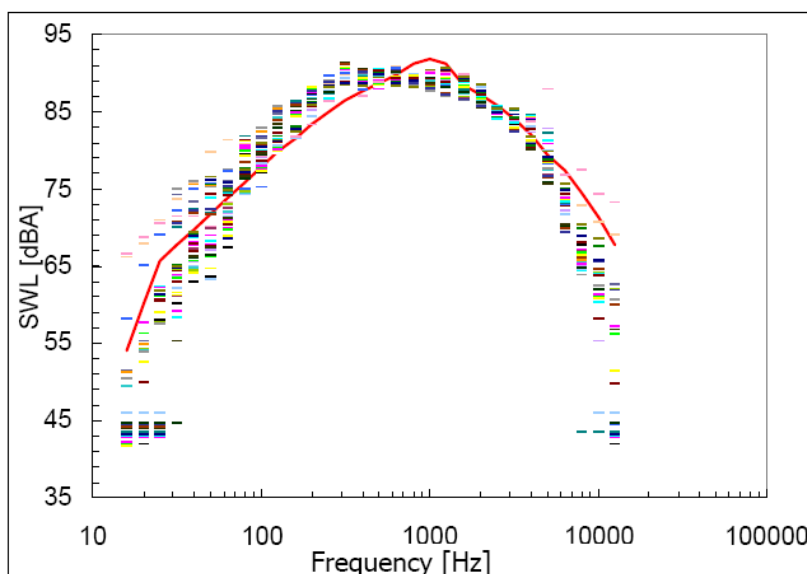
$$SPL_{1/3} = 10 \log_{10} \left[\frac{M^2 M_m^3 l^2}{R^2} \right] - 30.5 (\log_{10} \hat{f} + 0.3)^2 + 126$$

$$\hat{f} = \frac{fl}{V_r}; \frac{l}{c} = 0.008 \alpha_{tip}; \frac{V_m}{V_r} = (1 + 0.036 \alpha_{tip}); M_m = \frac{V_m}{a_0}$$

		ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 10 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			


Graphs 3 and 4 compare the semi-empirical Gnoise model standardized according to expression [1] with the standardized noise measurements analyzed previously for G5X wind turbines.

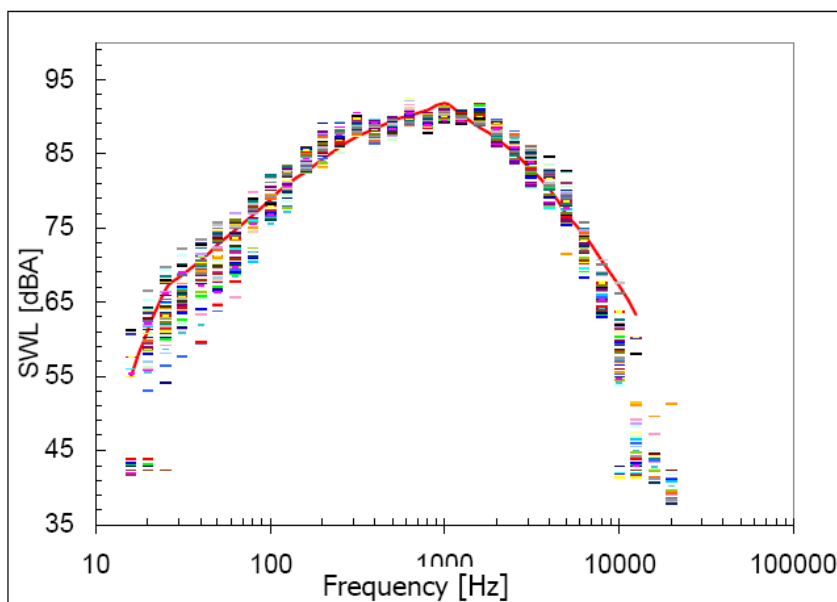
- **G52**




Graph 3: Gnoise Model comparison with experimental measurements for G52 wind turbines

- **G58**

	ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 11 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		




Graph 4: Gnoise Model comparison with experimental measurements for G58 wind turbines

	ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 12 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

7. PROPOSED METHOD

Starting with the noise measurements in third octaves made by accredited centers for G58 and G52 wind turbines, there are three standardized models for every turbine:

- Optimistic model: This model assigns greater energy content to high frequencies.
- Pessimistic model: This model assigns greater energy content to high frequencies.
- Average: This model contains approximately 50% of the share of the previous models.


		ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 13 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

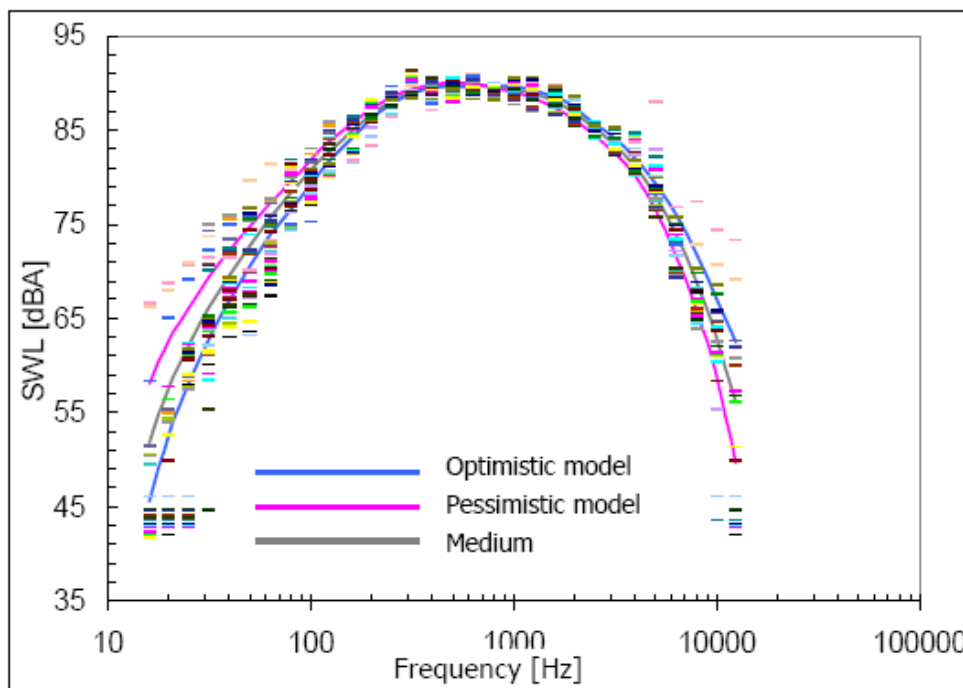
1. Proposed models for G52

Table 1 presents three models based on the standardized one-third octave-band noise measurements at 100dB carried out by accredited centers for G52:


Modelo optimista		Modelo pesimista		Media	
f [Hz]	100dB	f [Hz]	100dB	f [Hz]	100dB
16	45,6	16	58,0	16	51,8
20	52,6	20	62,6	20	57,6
25	58,2	25	66,1	25	62,2
31,5	62,9	31,5	69,5	31,5	66,2
40	66,9	40	72,2	40	69,5
50	70,5	50	74,7	50	72,7
63	73,9	63	77,3	63	75,7
80	76,7	80	79,6	80	78,4
100	79,2	100	81,8	100	80,7
125	81,8	125	83,9	125	82,8
160	84,2	160	85,7	160	84,9
200	86,2	200	87,3	200	86,8
250	87,9	250	88,5	250	88,2
315	88,9	315	89,4	315	89,1
400	89,4	400	89,8	400	89,6
500	89,7	500	90,0	500	89,8
630	89,7	630	90,0	630	89,8
800	89,7	800	89,5	800	89,6
1000	89,7	1000	89,1	1000	89,4
1250	89,3	1250	88,4	1250	88,9
1600	88,5	1600	87,4	1600	88,0
2000	87,3	2000	86,1	2000	86,8
2500	85,7	2500	84,4	2500	85,2
3150	84,1	3150	82,6	3150	83,3
4000	81,9	4000	80,2	4000	81,1
5000	79,3	5000	76,5	5000	78,0
6300	76,1	6300	71,6	6300	73,9
8000	71,6	8000	65,6	8000	68,6
10000	67,0	10000	58,8	10000	62,9
12500	62,5	12500	49,6	12500	56,1
$L_{Aeq,TOT}$	100	100	100	100	100

Table 1: Spectral distribution model for G52 wind turbines

		ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 14 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			



Graph 5: Spectral distribution model for G52 wind turbines


		ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 15 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

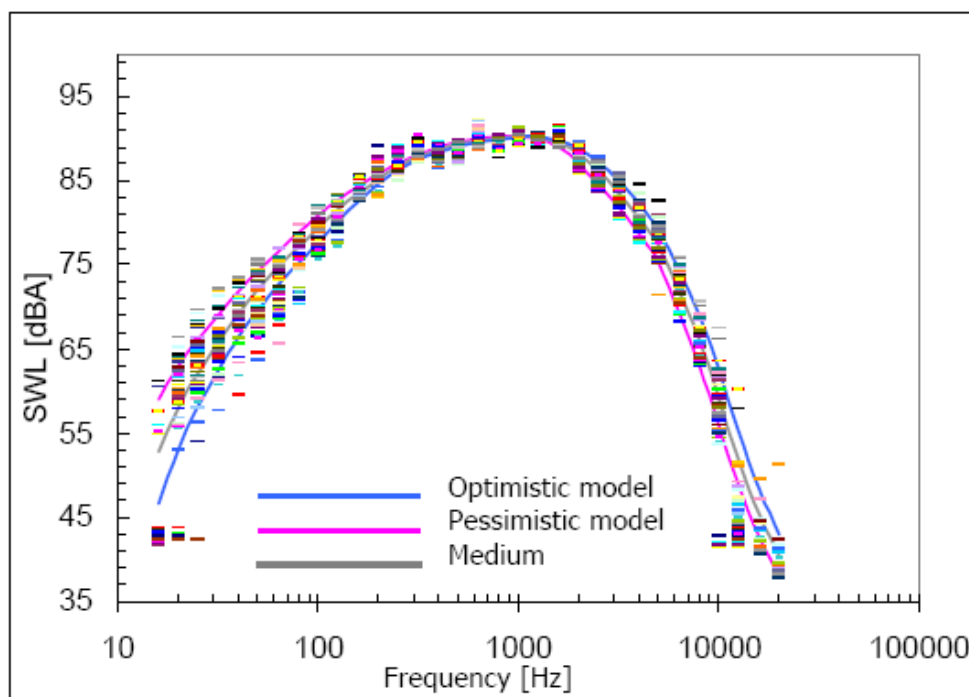
2. Proposed models for G58

Table 2 shows three standardized spectral noise distribution models at 100dB for the G58 wind turbine.


Modelo optimista		Modelo pesimista		Media	
f [Hz]	dBA	f [Hz]	dBA	f [Hz]	dBA
16	46,5	16	59,0	16	52,8
20	53,0	20	62,9	20	57,9
25	58,0	25	66,1	25	62,0
31,5	62,4	31,5	69,0	31,5	65,7
40	66,4	40	71,9	40	69,1
50	69,5	50	74,2	50	72,1
63	72,6	63	76,6	63	74,7
80	75,2	80	78,8	80	77,1
100	77,7	100	80,8	100	79,4
125	80,1	125	82,6	125	81,5
160	82,6	160	84,4	160	83,5
200	84,6	200	85,8	200	85,2
250	86,3	250	87,1	250	86,7
315	87,6	315	88,2	315	87,9
400	88,4	400	89,0	400	88,7
500	89,1	500	89,6	500	89,3
630	89,6	630	90,0	630	89,8
800	89,9	800	90,3	800	90,1
1000	90,2	1000	90,3	1000	90,3
1250	90,3	1250	90,0	1250	90,2
1600	89,8	1600	89,0	1600	89,5
2000	88,7	2000	87,1	2000	88,1
2500	87,2	2500	84,7	2500	86,2
3150	85,0	3150	81,9	3150	83,6
4000	82,3	4000	78,7	4000	80,6
5000	79,1	5000	75,3	5000	77,3
6300	74,4	6300	69,4	6300	71,9
8000	69,0	8000	63,1	8000	66,2
10000	62,7	10000	55,9	10000	59,1
12500	55,3	12500	49,1	12500	52,0
16000	48,3	16000	42,5	16000	45,3
20000	43,0	20000	37,9	20000	40,4
L_{Aeq}	100		100		100

Table 2: Spectral distribution models for G58 wind turbines.

		ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 16 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			




Graph 6: Spectral distribution model for G58 wind turbines

	ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP	A (TO): VG Energy	DATE: 29/03/12
		Página (Page): 17 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>		
ASUNTO (SUBJECT): <p style="text-align: center;">Spectral Analysis of Noise Emissions in G5X Wind Turbine</p>		

8. REFERENCES

- [ref.1]: IEC "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques. Second edition. 2002-12
- [ref.2]: "WAGNER, BAREIß, GUIDATI. "WIND TURBINE NOISE"
- [ref.3]: Noise reports drawn up by accredited centers for the G52 wind turbine.
 - DEWI S AM 106/03
 - DEWI S AM 107/03
 - DEWI S AM 108/03
 - DEWI S AM 110/03
 - DEWI S AM 111/03
 - DEWI S AM 112/03
 - DEWI S AM 113/03
 - DEWI S AM 114/03
 - DEWI S AM 126/03
 - DEWI S AM 127/03
 - WT 5540/07
- [ref.4] Noise report drawn up by Windtest for **G58 wind turbines**.
 - DEWI S AM 119/03
 - DEWI S AM 121/03
 - DEWI S AM 128 / 03, 2003-11-25
 - DEWI S AM 129 / 03, 2003-11-25
 - DEWI AM 05 02 05 - 01
 - DEWI AM 05 02 05 - 02
 - DEWI AM 050205 - 05- 04
 - DEWI AM 050205 - 06
 - DEWI AM 050304 - 10

		ENGINEERING COORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 18 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

APPENDIX B: EXAMPLE OF FREQUENCY SPECTRUM TRANSFER


Below is a practical example of the noise spectrum calculation for a G52 wind turbine with a LEVEL 1 control law, a tower height of 49 meters and a speed at the hub of 9 m/s.

From **Table 1** (or from **Graph 5**) we obtain the standardized spectral distribution of frequencies, which in this case is presumed to correspond to the average model. **Table 4** gives the noise level corresponding to the conditions specified, which in this specific case is **101.2 dB(A)**.

In the first column of **Table B1**, the frequency is divided in third octaves. The second column indicates the values corresponding to each one-third octave for the standardized spectrum (obtained from Table 2), whereas the third column indicates the corrected values for a noise level of 101.2dBA. As you can see, the values in the third column are those of the second plus 1.2dB ($101.2\text{dB} - 100\text{dB} = 1.2\text{dB}$), as indicated in the equation [2].

	100 dBA	102.1 dBA
f [Hz]	[dBA]	[dBA]
16	51,8	53
20	57,6	58.8
25	62,2	63.4
31.5	66,2	67.4
40	69,5	70.7
50	72,7	73.9
63	75,7	76.9
80	78,4	79.6
100	80,7	81.9
125	82,8	84
160	84,9	86.1
200	86,8	88
250	88,2	89.4
315	89,1	90.3
400	89,6	90.8
500	89,8	91
630	89,8	91
800	89,6	90.8
1000	89,4	90.6
1250	88,9	90.1
1600	88,0	89.2
2000	86,8	88
2500	85,2	86.4
3150	83,3	84.5
4000	81,1	82.3
5000	78,0	79.2
6300	73,9	75.1
8000	68,6	69.8
10000	62,9	64.1
12500	56,1	57.3

Table B1. Displacement of the frequency spectrum from 100dBA to 101.2 dBA for a G52 wind turbine.

		ENGINEERING CORDINATION MEMORANDUM	ECCM: F11-12-ECM138
DE (FROM): WFP		A (TO): VG Energy	DATE: 29/03/12
			Página (Page): 19 de (of): 19
<p>This document or embodiment of it in any media and the information contained in it are the property of Gamesa Corporación Tecnológica S.A. It is an unpublished work protected under copyright laws free of any legal responsibility for errors or omissions. It is supplied in confidence and it must not be used without the express written consent of Gamesa Corporación Tecnológica S.A. for any other purpose than that for which it is supplied. It must not be reproduced in whole or in part in any way (including reproduction as a derivative work) nor loaned to any third part. This document must be returned to Gamesa Corporación Tecnológica S.A. on demand.</p>			
ASUNTO (SUBJECT): Spectral Analysis of Noise Emissions in G5X Wind Turbine			

The result of the process is clearly represented in the graph in **Figure B1**.

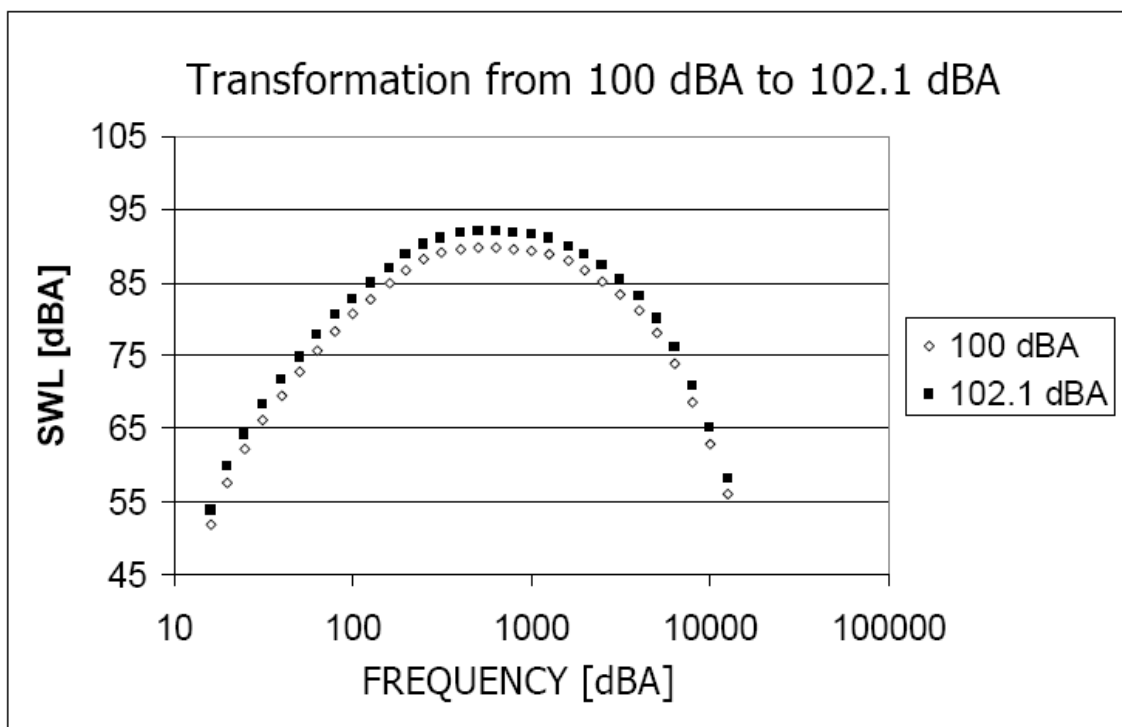


Figure B1. Graphic representation of displacement of the frequency spectrum from 100dB to 102.1dB for a G52 wind turbine.

5. ECOLOGY

i. **Methodology**

In compliance with ‘Assessing the impact of small-scale wind energy proposals on the natural heritage, February 2012’¹ a site assessment has been undertaken, the results of which will be attached as an appendix to this document. Digital datasets from Scottish Natural Heritage (SNH) will be consulted to identify the designated environmental sites within the region and to analyse if these will be impacted by the proposed development.

a. Main Policy and Guidance²

SNH recognises that birds and bats are the main classes of fauna perceived to be potentially vulnerable to wind energy developments, through collision with turbine blades. The relevant policy and guidance to wind turbine developments such as the one proposed here therefore centres on the protection of these. Nevertheless, other protected habitats and species must also be taken into consideration, such as the potential for disturbance posed to Badgers, which are protected by the Protection of Badgers Act 1992.

Birds

The EU Birds Directive (2009/147/EC) creates a comprehensive scheme of protection for all wild bird species naturally occurring in the EU. Initially established in 1979, the directive recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It is also recognised that wild birds (many of which are migratory) are a shared heritage of the Member States and that their effective conservation required international co-operation throughout the EU.

Great emphasis is placed on the protection of habitats for endangered or migratory species (listed in Annex I) through the establishment of a coherent network of Special Protection Areas (SPAs). Since 1994, all SPAs form an integral part of the EU wide NATURA 2000 ecological network.

The 1981 Wildlife and Countryside Act {amended by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2011} prevents the intentional or reckless disturbance of wild birds, their nests and eggs, (in addition to protecting other animal species, plants and habitat types).

Bats

Natural England have produced best practice guidance documents, which suggest that wind turbines be situated in positions where their blade tips are at least 50m from hedges, tree-lines or woodland areas, and water bodies.

¹ <http://www.snh.gov.uk/docs/A669283.pdf>

² <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/>

Protected habitats

The 1992 Habitats Directive (92/43/EEC) affords protection to certain habitats and species identified in the Directive, including those requiring strict protection (European protected species). These areas are known as Special Areas of Conservation (SAC). The Habitats Directive combines with the Birds Directive to form the foundation of Europe's nature conservation policy – the Natura 2000 network. This protects over 1,000 animal and plant species, in addition to 200 'habitat types,' such as special types of forests or wetlands that are of European importance.

The aim of the network is to assure the long-term survival of Europe's most valuable and threatened habitats and species. The Natura 2000 network is not a collection of explicitly nature only preserves - where all human activities are forbidden. The network will certainly include land likely to be privately owned. The emphasis in this case will be on ensuring that future management is sustainable, both economically as well as ecologically. The establishment of this network of protected areas also fulfils a member state obligation under the UN Convention on Biological Diversity.

In order to comply with the legislation outlined, this assessment aims to determine whether any adverse impact is likely to be caused to protected species and areas through the proposed wind turbine development.

b. Designated Environmental Sites

The legislation described above has led to the formation of the following protected areas of nature conservation:

Sites of Special Scientific Interest (SSSI)	Areas of land that represent a wide range of natural features, from vulnerable plants or animals, to high-quality habitat examples, such as wetlands or meadows. Legally protected through a number of Acts including the Wildlife and Countryside Act 1981.
Special Protection Areas (SPA)	European designated sites, protected under the Wild Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) [previously Directive 79/409/EEC]. These sites have been identified as being of international importance to rare or vulnerable bird species.
Special Areas of Conservation (SAC)	European designated sites, protected under the 1992 Habitats Directive (92/43/EEC) are intended to form a European Community-wide network of protected areas (Natura 2000) for those habitats and species which are endangered, vulnerable, rare, or otherwise require special attention.
Royal Society for the Protection of Birds (RSPB) Reserves	Maintain a number of reserves in places ranging from cliffs to urban areas for birds and other wildlife

Additional sites are also taken into consideration, including Ramsar sites, which are wetlands of international importance designated under the Ramsar Convention; National and Local Nature Reserves (NNRs and LNRs), which are important sites for wildlife, geology, education or public enjoyment; National Parks; and Country Parks A map containing all designated environmental

sites within a 20km study zone has been produced (see Appendix). Within 20km there are several SPAs, SACs, SSSIs, National Nature Reserves, RSPB Reserves and the Cairngorms National Park, located circa 7km north of the proposed turbine.

These designated environmental sites are identified by SNH as important habitats to consider with a medium-scale wind turbine planning application and shall therefore be the focus of this assessment.

ii. Designated Environmental Sites near to The Corb

a. Special Protection Areas within 20km

TABLE 1: SPAs WITHIN 20KM

Site No.	Site Name	Category	Feature	Distance (~km)
8503	Forest of Clunie	Birds – Aggregation of breeding birds	Hen Harrier (<i>Circus cyaneus</i>), Merlin (<i>Falco columbarius</i>), Osprey (<i>Pandion haliaetus</i>), Short-eared Owl (<i>Asio flammeus</i>)	7.7
8535	Loch of Lintrathen	Birds – Aggregations of non-breeding birds	Greylag Goose (<i>Anser anser</i>)	10.6
10234	Cairngorms Massif	Birds – Aggregation of breeding birds	Golden Eagle (<i>Aquila chrysaetos</i>)	15
8534	Loch of Kinnordy	Birds – Aggregations of non-breeding birds	Greylag Goose (<i>Anser anser</i>), Pink-footed goose (<i>Anser brachyrhynchus</i>)	18.8

Description:

1. Forest of Clunie³

Extending north from the Dunkeld - Blairgowrie Road to the southern slopes of Ben Vrackie in the northwest and Spittal of Glenshee in the northeast. The area is covered mainly by heather moorland and grassland, with scattered, small stands of woodland, two areas of recent native pinewood plantation and several small lochs.

Forest of Clunie SPA qualifies under **Article 4.1** by regularly supporting breeding populations of European importance of the Annex 1 species Hen Harrier *Circus cyaneus* (average of 20 breeding females between 1994 and 1998, 4% of GB), Osprey *Pandion haliaetus* (average of 6 pairs between 1994 and 1998, 6% of GB), Short-eared Owl *Asio flammeus* (15 pairs in 1998, 2% of GB),

³ Forest of Clunie; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8503

and Merlin *Falco columbarius* (12 pairs in 1998, 0.9% of GB). The Hen Harrier population on this site is one of the largest and densest in Britain. The Osprey population on this site is one of the largest in the British SPA network. Both Short-eared Owl and Merlin are very widely dispersed across their British distributions and the Forest of Clunie is one of very few sites to support significant numbers.

2. Loch of Lintrathen⁴

The site qualifies under **Article 4.2** by regularly supporting, in winter, internationally important numbers of the Icelandic population of greylag geese *Anser anser*. In the five-winter period 1985/86 to 1989/90 an average peak of 2,100 birds was recorded, representing 2% of the total population, all of which winters in Britain.

Loch of Lintrathen is also of importance for its assemblage of wintering birds typical of open water and associated wetlands. These include: whooper swan *Cygnus cygnus cygnus* (an Annex I species), wigeon *Anas penelope*, teal *Anas crecca*, mallard *Anas platyrhynchos*, and goosander *Mergus merganser*.

3. Cairngorms Massif⁵

The Cairngorms Massif Special Protection Area (SPA) is a large, upland site in the north east Highlands. The boundary of the SPA incorporates the majority of the Cairngorm Massif and the higher hills and mountains stretching to the west and south to the Dalnamein Forest, Beinn a' Ghlo, and Ben Vrackie in Perthshire; to the east to Caenlochan, Lochnagar, and the heads of the Angus Glens as far as Mount Keen and Glen Tanar in Grampian; and from upper Deeside north to Abernethy.

The site rises from 270m to over 1300m and encompasses a diverse range of habitats including heather moorland/grouse moor, grassland, blanket bog, native woodland, freshwater lochs and lochans, extensive areas of montane heaths and exposed rock and scree. Many of these habitats are recognised at a European level and the SPA overlaps Beinn a' Ghlo, Caenlochan, Cairngorms, Ballochbuie, Coyles of Muick SACs along with the upper tributaries of the River Dee, River South Esk, River Tay and River Spey riverine SACs. The SPA overlays all or parts of Abernethy Forest, Cairngorms, Forest of Clunie, Ballochbuie, Glen Tanar, Caenlochan and Lochnagar SPAs.

The Cairngorms Massif SPA qualifies under **Article 4.1** by regularly supporting a breeding population of European importance of the Annex 1 species golden eagle *Aquila chrysaetos* (26 active territories in 2003, representing approximately 5.8 % of the GB population).

⁴ Loch of Lintrathen; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8535

⁵ Cairngorms Massif; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=10234

4. Loch of Kinnordy⁶

The Loch of Kinnordy Special Protection Area is an eutrophic loch with associated wet meadows and marshes in Angus, Scotland. The site is of international importance for its wintering and breeding birds.

The boundary of the Special Protection Area is coincident with that of the Loch of Kinnordy SSSI. The site qualifies under **Article 4.2** of the EC Wild Birds Directive by regularly supporting internationally important wintering numbers of the Iceland population of greylag geese *Anser anser* and the Icelandic/Greenlandic population of pink-footed goose *Anser brachyrhynchus*. During the five-winter period 1986/87 to 1990/91 average peak counts of 910 greylag geese, and 3,960 pink-footed geese were recorded, representing 1% and 3% of the respective international populations.

Also notable under **Article 4.2** are nationally important breeding populations of five migratory species: 4 pairs of black-necked grebe *Podiceps nigricollis* (15% of the British population); 7 pairs of Gadwall *Anas strepera* (1% of British); 19 pairs of shoveler *Anas clypeata* (1% of British); 7 pairs of pochard *Aythya ferina* (2% of British); and 7,000 pairs of black-headed gull *Larus ridibundus* (3% of British).

The site is additionally important for its assemblage of wintering waterfowl typical of open water and associated wetlands. These include wigeon *Anas penelope*; teal *Anas crecca*; mallard *Anas platyrhynchos*, tufted duck *Aythya fuligula*; goldeneye *Bucephala clangula*; and goosander *Mergus merganser*.

Table 4: connectivity with SPAs⁷

Protected Area Name	Qualifying interests	Maximum range	Is the application within the range for any of the qualifying interests
Forest of Clunie	Hen Harrier	2-3km	No
	Osprey	10km	No
	Short-eared owl	2km	No
	Merlin	5km	No
Loch of Lintrathen	Greylag goose	15-20km	Yes
Cairngorms Massif	Golden eagle	2-3km	No

⁶ Loch of Kinnordy; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8534

⁷ Connectivity of SPAs; <http://www.snh.gov.uk/docs/A675474.pdf>

Protected Area Name	Qualifying interests	Maximum range	Is the application within the range for any of the qualifying interests
Loch of Kinnordy	Greylag goose	15-20km	Yes
	Pink-footed goose	15-20km	Yes

b. Special Areas of Conservation within 5km

TABLE 5: SACs WITHIN 5KM

Site No.	Site Name	Category	Feature	Distance (~km)
8244	Dun Moss and Forest of Alyth mires	Bogs (Wetland)	Active raised bog	0.7
8366	River Tay	Fish; Mammals; standing open water and canal	Brook lamprey (<i>Lampetra planeri</i>); Sea lamprey (<i>Petromyzon marinus</i>); Atlantic salmon (<i>Salmo salar</i>); River lamprey (<i>Lampetra fluviatilis</i>); Otter (<i>Lutra lutra</i>); Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	2.5

c. Sites of Special Scientific Interest within 2km

TABLE 6: SSSIs WITHIN 2KM

Site No.	Site Name	Category	Feature	Distance (~km)
649	Forest of Alyth Mires	Bogs (Wetland)	Raised Bog	0.7
555	Dun Moss	Bogs (Upland)	Saddle mire	0.7

Description:

1. Forest of Alyth Mires⁸

The Forest of Alyth Mires lie 7 miles due north of Blairgowrie. Formed in the undulating hill ground of the Forest of Alyth, this site consists of a complex of raised and intermediate bogs with associated marginal fen, habitats which are very rare in Great Britain.

⁸ Forest of Alyth Mires; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=649

This site is considered to be a nationally important peatland because it has an unusually extensive series of confined upland raised bogs. Two of the raised bogs are particularly undisturbed and vegetation here includes some uncommon bog mosses. The poor-fen bounding the raised bogs is especially extensive.

Dwarf birch *Betula nana*, a nationally scarce species, occurs in one of the bogs. This species is on the southern and eastern extremity of its range in Scotland and at a comparatively low altitude. The moss species are locally scarce and characteristic of relatively undisturbed bogs.

With the two bogs at the neighbouring Dun Moss, the two sites together form the only series of raised bogs in Eastern Perth & Kinross.

2. Dun Moss⁹

Dun Moss lies 10 kilometres due north of Blairgowrie amid the gently rolling hills of the Forest of Alyth. It is an example of an upland saddle raised bog, a type that is extremely rare in Great Britain.

The bog system is intact and still shows a distinct nutrient-poor fen lagg around its margin. The bog surface is raised, and receives its water exclusively in the form of rain and snow fall. The wet heath vegetation on Dun Moss is unusual, rich in lichens, and includes a number of uncommon species of bog moss *Sphagnum* species. A second small raised bog occurs on a “bench” in the slope in eastern part of the site.

The site is contiguous with Forest of Alyth Mires SSSI, which is a unusually extensive series of confined upland raised bogs. The two sites can be considered to be part of the same series of bogs (the only such series of bogs in Eastern Perth & Kinross).

Habitat description

Using satellite imagery and a site visit, the site can be described as ‘Neutral Grassland’ as per Phase 1 Habitat Survey guidance. Neutral grassland is described as ‘typically enclosed and usually more intensively managed than acid or calcareous grassland (except on roadside verges), this category encompasses a wide range of communities occurring on neutral soils (pH 5.5-7.0).

iii. **Potential Impacts**

It is unlikely that one medium sized turbine will have a significant impact upon local flora and fauna as the turbines are not located within a designated site: therefore the construction of the foundations, access track, cable trench and other ancillary works should not pose a threat to any protected species of flora or fauna. Birds and Bats are the most likely animal species to suffer fatalities from turbines through direct collisions and are subsequently important to a wind turbine Planning Application. Drumderg Windfarm is also located within the vicinity of this landscape, and has posed no threat to the local flora and fauna.

⁹ Dunn Moss; http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=555

The closest SPA is located 7.7km west of the proposed turbine location, and is designated for species such as the Hen Harrier. The turbine is out-with the core foraging range for the following species; Hen Harrier, Osprey, Short-eared owl and Merlin. The turbine is within the core foraging range for Pink-footed geese and Greylag geese.

Due to the distance of the turbine from the SPAs listed above, there will be little to no impact on the protected species.

It has to be noted that displacement and barrier movement is not likely to have a significant effect on the species as it is a single turbine development.

iv. Mitigation Measures

It is perceived that this development will only consist of one medium sized turbine, and the fact that it lies outside any environmental designated site would suggest that the erection of the turbine will not have any real significant effect on the local and regional ecology.

Surveys are being carried out as requested from the initial ecological appraisal (see appendix C).

Bats

Following best practice guidance referred to by SNH and produced by Natural England on Bats (TIN051), the turbine has been sited at least 50m away from any linear features such as trees, walls, hedges, buildings and water bodies; so as to ensure there will be no impact on bat populations that could utilise the area.

The Joint Nature Conservation Committee (JNCC) has identified through their research that a bat survey should normally be recommended for turbines located within 50m of Buildings, structures, woodland, hedgerows, rivers or lakes, or within sites designed for bats (SSSI or SACs)¹⁰. Since this turbine will be located in open farmland away from any structures or woodland, this should not be an issue and bat surveys will not be required.

¹⁰ Natural England, www.naturalengland.org.uk

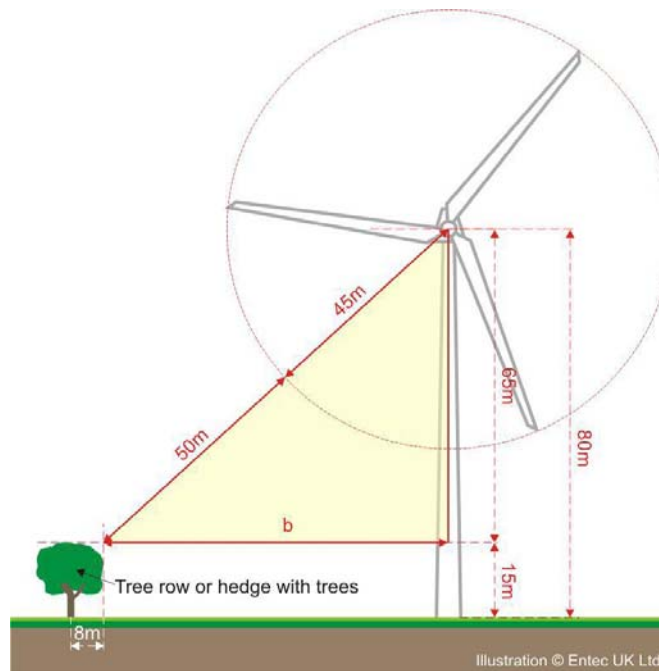


FIGURE 1: TURBINE DISTANCE ADVICE FOR BATS¹¹

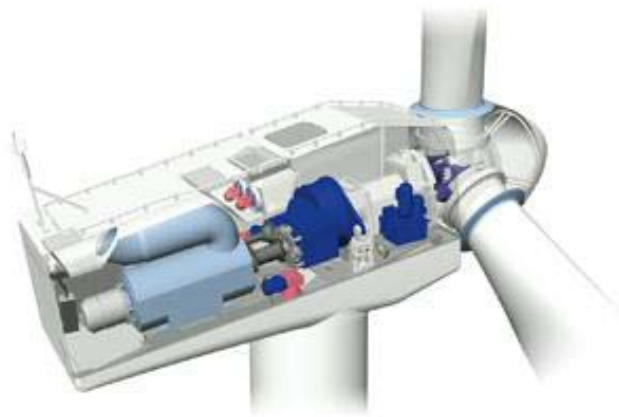
PLEASE NOTE THAT THIS DIAGRAM IS NOT REPRESENTATIVE OF THIS PROJECT

The majority of bat species are also known to use echolocation calls which are only useful within a couple of meters. Therefore they tend to fly closer to habitats such as hedgerows, woodlands, walls, rivers, and within tree canopies. These species are less likely to collide with a turbine. Natural England research also suggests that the further away the turbine is positioned from linear habitats, the larger the decline in activity.

Good practice measures will be taken where necessary including:

- Site Selection (to reduce impacts on wildlife).
- Locating turbines so that their blade tips are at least 50m from hedges, tree-lines or woodland in the vicinity.
- If there are roosts within the vicinity of the proposed turbine, turbines will be positioned as far away as possible from the roosts and from any flight paths.

¹¹ SNH, <http://www.snh.gov.uk/docs/C245244.pdf>



Additional Cumulative Landscape Assessment:
Single Wind Turbine Development at The Corb
12/01934/FLL

Client: Mr N. Bailey

Site Location: The Corb
Bridge of Cally
Glenshee
Perthshire
PH10 7JX



Compiled by:

Erin Fairley BSc(Hons);
David Anderson BSc(Hons);
Christopher Lockett BA (LMLI); and
Karen Pinckney (CMLI)

Planning & Environment Department

Prepared by: Chris Lockett

Edited by: Karen Pinckney

Approved by: David Anderson

Disclaimer:

© Copyright 2013 VG Energy Limited. All rights reserved.

No part of this report may be copied or reproduced by any means without prior written consent from VG Energy Limited. If this report has been received in error, please destroy all copies in possession and notify VG Energy Limited at the above address.

This report has been prepared for the exclusive use of the named client and unless otherwise agreed in writing by VG Energy, no other party may use, make use of or rely on the contents of the report. No liability is accepted by VG Energy Limited for any use of this report, other than for the purpose for which it has been written.

The information and opinions provided in this report have been developed from the expertise of VG Energy Limited using due diligence, skill, care and attention to detail in its preparation and production. It should be noted, however, that no independent verification of any of the information supplied to VG Energy Limited has been made, unless expressly stated otherwise.

Contents

1.	INTRODUCTION	4
I.	Planning Application.....	4
II.	Pre-Application and Council Planning Meetings/Design Development Coordination	5
III.	Turbine Specifications	7
2.	ADDITIONAL CUMULATIVE LANDSCAPE & VISUAL ASSESSMENT.....	8
I.	Cumulative Visual Impact Assessment	8
i.	Cumulative Study Area	9
ii.	Cumulative Effects on Visual Amenity	11
iii.	Combination Views.....	14
iv.	Succession Views	17
v.	Sequential Effects	18
vi.	Predicted Cumulative Visual Impact.....	21
II.	Summary of Findings (Overall Effect) of Cumulative Impacts	30
3.	GUIDANCE AND POLICY	32
I.	Local Planning Guidance.....	32
vii.	Landscape Designations and Policy	36
	APPENDIX.....	40

1. INTRODUCTION

I. Planning Application

This additional landscape assessment work is submitted as addendum to Planning Application [12/01934/FLL], the installation of a single Gamesa™ G-58, 850kW wind turbine at The Corb, Bridge of Cally.

Original Screening Opinion Request [Ref. 12/00233/PREAPP] was submitted to which a reply was received on the 16th of April 2012, stating than an Environmental Impact Assessment (EIA) was required. Following on-site assessment by VG Energy Ltd Ecology Department and the relocation of the turbine site, the proposal was reassessed by Perth and Kinross Council [12/00819/SCRN], a reply to which was received 22nd May 2012, stating that full EIA was not required:

- *“The visual impacts of a proposal of this scale and nature will require careful assessment at application stage ... A full landscape assessment will need to form part of any planning application”;*
- *“A visual assessment should also include an appraisal of wider cumulative effects and the relationship to the operational Windfarm at Drumderg”.*

The original application [12/01568/FLL] for a 70m (tip height) turbine was withdrawn on the 24th October, 2012. This was through coordination with Perth and Kinross Council to allow for the re-submitting of the current application for increased typology to minimise visual conflict with neighbouring Drumderg Wind Farm. History of design development and coordination with Perth and Kinross Council is out-lined below.

The proposed development turbine sees a tower height of 55 metres (m), a blade diameter of 58m and height to blade tip of 84m. This document provides analysis of material requested by the competent authority (Perth and Kinross Council) in relation to perceived cumulative impact.

This supporting information does not replace and is in addition to Landscape and Visual Impact Assessment submitted and existing for application [12/01934/FLL].

This addendum has been prepared by VG Energy Ltd Landscape Department on behalf of Mr Bailey. This application for planning consent is made under the Town and Country Planning (Scotland) Act (as amended) 2006.

II. Pre-Application and Council Planning Meetings/Design Development Coordination

1st October, 2012 – [12/01568/FLL] Meeting held with Perth & Kinross Council Planning Officer- *Planning & Regeneration* to determine the parameters of study (baseline study area) and the approved methodology for assessing the impacts and effects of the proposed development on sensitive receptors and the landscape and visual amenity. All parties agree upon the methodology determined for appropriate study.

23rd October, 2012 – Confirmed support for larger turbine typology received from Perth & Kinross Planning Officer- *Planning & Regeneration* to help mitigate visual impacts of single turbine development in proximity to existing Drumderg Wind Farm.

- *“The 84m to tip turbine works more successfully in terms of its relationship to Drumderg and (I) believe it would be more prudent to move forward with that proposal... this would be considered a material change to the application and would require the withdrawal (sic.) of the current application and the submission of a new application with the landscape assessment updated to reflect our discussions. I would appreciate if you could confirm, in writing, your intention to withdraw the application or whether you wish me to continue to determine the smaller turbine.”¹*

24th October, 2012 – Application [12/01568/FLL] is withdrawn formally to allow for re-submission of larger typology development.

5th November, 2012 – Through coordination with the Planning Officer and in assessment of relevant Perth and Kinross Council submitted wind farm applications, the Landscape and Visual Impact Assessment is submitted for 84m (tip) turbine [12/01934/FLL].

16th November, 2012 – Uncharacteristically for this scheduled development (single turbine), as stated by Planning Officer, the Council Landscape Architect is introduced and additional viewpoints and methodology are requested. (This is deemed by the acting agent to be out of context with the scale of development and perceived impacts and resultant effects as determined through the confirmed methodology of reporting).

- *“The Council’s Landscape Architect... has given me some comments on this application. He does not normally become involved in the applications for single turbines and usually comments on the larger schemes where an EIA has been requested, and that was why I didn’t consider it necessary for him to be involved in any pre-application meetings which we had... I appreciate that the above is a significant amount of work for a single turbine project, however the proposed turbine location is in close proximity to a number of wind energy proposals and consents and its sensitive location close to the Highland Boundary Fault means that this level of study is required to make a proper assessment of the proposal.”²*

¹Electronic Communication, Sent from Perth & Kinross Tue 23/10/2012 16:30

²Electronic Communication, Sent from Perth & Kinross Fri 16/11/2012 16:47

15th January, 2013 – (After Holiday Period) Coordination meeting is held with Perth & Kinross Council Planning Officer- *Planning & Regeneration* and Council Landscape Architect to review scale of development and scope of analysis for scheduled scale of **Non-EIA** project.

From this meeting the Photomontage/Wireframe viewpoints are agreed for Council determination of re-locating the larger turbine typology to its original site location to allay Council Landscape Architect concerns regarding minor separation distance of the proposed development to Drumderg Wind Farm from two (2) upland locations – Creigh Hill and Balmyle Hill.

Currently – Through assessment of the previous site location and issuance of informal visualisations for review by the competent authority (Perth & Kinross Council), it is determined that due to insignificance of change in visual effects resulting from the limited area in which to re-site the turbine, the application is proposed to remain as designed. A proposed development which:

- Presents no significant impact to ecological concerns as identified and reported in the Environmental Report and Ecological Assessment (conducted through coordination with Scottish Natural Heritage (SNH) to identify non-significant impact to species or habitat).
- Presents no significant impact to identified archaeological and historical features.
- Impacts limited concentrations of residential receptors. Impacts which are found to be acceptable in terms of guidance and Local Plan/Scottish Planning Policies.
- Presents no significant adverse cumulative impact and resultant effect as identified in the original Environmental Report (LVIA) and further addendum assessment.
- Has received no Specialist Consultee or public opposition.

III. Turbine Specifications

The turbine details as proposed for this project, application [12/01934/FLL], are shown below:



FIGURE 1: GAMESA™ TURBINE

TABLE 1.1: TURBINE SPECIFICATIONS

No. of Turbines	1 x Gamesa™ G58
Hub Height	55m
Rotor Diameter	58m
Height to blade tip (max.)	84m
Generating capacity	850 kilowatts (kW)
Colour	Light grey, matt finish.

2. ADDITIONAL CUMULATIVE LANDSCAPE & VISUAL ASSESSMENT

I. Cumulative Visual Impact Assessment

“Cumulative impacts can be defined as the additional changes caused by a proposed development in conjunction with other similar developments.” – Guidelines for Landscape and Visual Impact Assessment, 2002 (Landscape Institute and IEMA).

Per guidance set forth by SNH, “Assessing the Cumulative Impact of Onshore Wind Energy Development (2012)”³:

8. A clear, transparent and detailed assessment process is needed to understand the impacts of a proposed windfarm development when it is seen alongside others in the area. The process needs to identify the overall impacts which may arise from a group of projects and distinguish the contribution of each individual project to these. The assessment should take account of existing windfarms, and those which are consented or at application stage.

33. The key principle for all cumulative impact assessments is to focus on the likely significant effects and in particular those which are likely to influence the outcome of the consenting process.

37. Once an application has been submitted and is accompanied by a complete and satisfactory Environmental Statement (*Note: only EIA required), any further assessment to take account of new proposals is likely to cause delay. The determining authority may consider that it cannot reasonably require further cumulative assessment by the applicant. In some locations the level of development is such that cut off dates should be considered to enable applications to progress.*

This section deals with the predicted cumulative effects on visual amenity caused by the proposed development, collectively with all known, existing and proposed wind turbine applications within proximity of The Corb, **the main requirement being an assessment that is proportionate to the impacts.**

³SNH, Assessing the Cumulative Impact of Onshore Wind Energy Developments, <http://www.snh.gov.uk/docs/A675503.pdf>

i. Cumulative Study Area

SNH guidance for determining the area of search and study for a Cumulative Landscape and Visual Impact Assessment relating to wind energy development pertains to large scale wind farming. As such, a suitably scaled approach needs to be implemented and followed for non-EIA Environmental Reporting on smaller-scale turbine applications.

The extent of cumulative study area should always be proportionate to the scale and size of the proposed application.

All potential cumulative impacts as perceived and determined use professional judgement based upon experience of assessment of various scales of wind energy development and individual Council consultations for extent of search and study, along with National advice and guidance for onshore wind energy developments.

SNH guidance, "Assessing the Cumulative Impact of Onshore Wind Energy Development (2012)"⁴ Paragraph 57 states:

*This is generic guidance only. The number of proposals in an area and the timing of applications give rise to development scenarios of varying complexity. **Professional judgement** should inform the scope of the study to be undertaken.*

- Through meeting with Perth and Kinross Council (15th January, 2013), development concerns were discussed relating to area wind farming and local impacts associated with existing and pending wind farm developments with the cumulative visual impact of development along the sensitive Highland Fault Line.
- For the scale/height of the proposed Corb development (84m tip), an appropriate cumulative search area of **35km** has been set along with an established cumulative study area of **10km**.
- A plan has been produced to show wind farm development within 35km of The Corb (see Appendix A, Figure 8).

⁴SNH, Assessing the Cumulative Impact of Onshore Wind Energy Developments, <http://www.snh.gov.uk/docs/A675503.pdf>

TABLE 2.1: WIND FARMS FALLING WITHIN 35KM SEARCH AREA OF THE CORB

Planning Reference Number	Status	Site & Turbine Location	Number of Turbines	Hub Height (m)	To Blade Tip (m)	Distance (km) & Direction
Perth and Kinross Council						
03/01917/FUL	App/Exist	Drumderg	16	67	107	1.33 SE
12/01423/FLL	Pending	Tullymurdoch	7	80	120	5.38 SE
12/00963/FLL	Pending	Bamff	7	71	111	6.49 SE
TCP/11/16(121)	App	Welton of Creuchies	4	64	98	7.78 SSE
04/00004/WIND	App/Exist	Griffin	68	-	124	23.46 SW
Angus Council						
03/00831/FUL	App	Ark Hill	8	55.6	79.6	23.80 SE
12/00570/EIAL	Pending	Govals	6	60	86.5	28.42 SE
12/00577/EIAL	Pending	Frawney	5	60	80	29.12 SE
12/00570/EIAL	Pending	Dodd Hill	5	80	126.5	32.58 SE

All cumulative application information is current to 26th March, 2013.

Information has been compiled from Local Council on-line planning data-sets.

- The nearest *existing* wind farm is Drumderg [03/01917/FUL] located 1.33km southeast.
- The nearest *approved* wind farm development is Welton of Creuchies [TCP/11/16(121)] located 7.78km South-southeast.
- The nearest *pending application* for wind farm development is Tullymurdoch [12/01423/FLL] located 5.38km Southeast.

A cumulative ZTV of identified wind energy development has been created using Resoft™ Windfarm software to the determined search area (see *Appendix, Figure 1*). This cumulative mapping of theoretical visibility enables the identification and assessment of areas impacted by multiple wind farm developments.

TABLE 2.2: WIND FARMS FALLING WITHIN 10KM STUDY AREA OF THE CORB

	The Corb	Drumderg	Bamff	Welton of Creuchies	Tullymurdoch
Landscape Character Type	Highland Summits & Plateaux LCT (large scale)		Highland Foothills LCT (small – medium scale)		
Height (Blade Tip)	84	107	111	98	120
Number of Turbines	1	16	7	4	7
Layout of Turbines	Single	Compact array	Open array	Linear	Compact array

ii. Cumulative Effects on Visual Amenity

Cumulative effects on visual amenity can be caused by **combined visibility** and/or **sequential effects**. These are defined as follows:

Combined Visibility

Combined visibility occurs where the observer/receptor is able to see two or more developments from one viewpoint. Assessments should consider the combined effect of all wind technology which is (or would be) visible from each relevant, identified viewpoint. Combined visibility may either be:

- In combination: Where several wind energy developments 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 wind energy developments.

Sequential Effects

Sequential effects occur when the observer/receptor has to move to another viewpoint to see different developments. Sequential effects should be assessed for travel along regularly-used routes like major roads, railway lines, ferry routes, popular paths, etc. Sequential effects may be:

- Frequently sequential: Where the features appear regularly and with short time lapses in between; to
- Occasionally sequential: Where long time lapses exist between appearances depending on speed of travel and distance between the viewpoints.

TABLE 2.3: MATRIX TO DETERMINE SIGNIFICANCE OF CUMULATIVE SEQUENTIAL EFFECTS*

	Distance Between Viewpoints			
Duration of View	<2km	2 – 4km	4 – 6km	>6km
>4 min	Major	Major/Moderate	Moderate	Moderate/Minor
2 – 4 min	Major/Moderate	Moderate	Moderate/Minor	Minor
1 – 2 min	Moderate	Moderate/Minor	Minor	Minor/None
<1 min	Moderate/Minor	Minor	Minor/None	None

Significance Criterion for Cumulative Sequential Effects:

Major:	There would be constant, open, and sustained views of wind technology developments; features appear regularly; there would be short time lapses between appearances; views are with direction of travel.
Moderate:	There would be slightly intermittent views of wind technology developments; features appear sporadically; there would be medium time lapses between appearances; some limited/screened views at an oblique angle to direction of travel; some limited/screened views with direction of travel.
Minor:	There would be highly intermittent, broken and short-lived sequential views; there would be long time lapses between appearances; views are at an oblique angle to direction of travel.
None:	Very little to no wind technology developments would be visible sequentially within the landscape; Very little to no cumulative sequential effects on visual amenity given type and scale of landscape.

* Impacts and effects will vary in degree according to:

Parameters to determine Cumulative Visual Effects:

- **Sensitivity** – Sensitivity of visual receptors;
- **Context** – The landscape context (Open landscape with wide panoramic views or an intimate landscape with enclosed views);
- **Activity** – The activity of the receptor (Residents, tourists/visitors, workers etc.) and their number; and
- **Magnitude of Cumulative Change** – The magnitude of change in terms of scale, nature, duration, frequency of combined and sequential views (glimpsed or prolonged views; oblique, filtered or direct views; time separation between sequential views).

The introduction of the proposed Corb development with other existing, approved and proposed wind energy developments would result in the introduction of a similar man-made vertical element as a minor new feature into the Highland Summits and Plateaux Landscape Character Type (LCT).

The influence of existing large scale wind farm activity is obvious within this local area of the LCT and from areas of the lower valleys and more distant upland (Mounth Highlands).

Specific cumulative impacts are assessed fully in the following sections to determine the likely significance of the proposal in context of the landscape and receptors therein, as a lone development on its merits, and in combination with like development within the parameters of study professionally determined and explained.

iii. Combination Views

These will be mainly from identified receptors within close proximity of the site (upland areas – predominantly hill walkers and road users within the local environment (also inclusive of upland and lowland areas with fixed views of multiple wind technology developments). As is identified by the cumulative ZTV (*see Appendix, Figure 1*), the greatest scope for viewing the proposed development in single views with other wind technology development occurs from the upper elevations of the Highland Summits and Plateaux within 10km radius and further afield to the south from Strathmore and the northern slopes of the Igneous Hills (Sidlaw Hills) 20 – 25km away from the proposed Corb development.

As is shown by photomontage visualisations No's. 5, 6, 8 and 9 (*see Appendix, Figures 7a, 8a, 10a and 11a*), when viewed in combination with wind energy development from wider landscape areas, the proposed Corb development is readily absorbed into the landscape and viewed as an acceptable part of Drumderg Wind Farm, not detrimental to already slightly impacted views. Such combined views are negligible.

As is shown by the map of wind turbine development within 35km of the proposed Corb project (*see Appendix, Figure 2*), the nearest wind farm is the existing Drumderg development [03/01917/FUL] (107m to tip typology). At 1.33km to nearest turbine, any combined impacts caused by the proposed development on the views from closer local receptors (predominantly upland hill walkers) and broken/intermittent sections of upland routes for moving receptors (A93, A924 and Tullymurdoch to Alyth local road) will be slight.

Major concerns for combined views result from difference in typology and clutter which results from variations in rotational speed and/or turbine types. The proposed turbine has been selected as a three blade, horizontal axis machine of matching colour to existing and proposed development.

Table 2.4 explains impacts of varying development.

TABLE 2.4: COMPARATIVE STUDY OF IMPACTING DEVELOPMENT WITHIN COMBINATION VIEWS

Development	Hub Ht.	Rotor Dia.	Tip Ht.	Rotation Speed	Notes:
The Corb	55m	58m	84m	14-31 rpm	Photomontage visualisations* have been prepared to show a range of distance views from varied receptors to include study area wind technology. While an overall tip height variance of 23m exists between the single turbine development and existing Drumderg, within the array of Drumderg the ground elevation between turbines ranges from 367m and 419m (AOD) providing a visual tip height variance of +/-52m. Given the elevation changes within the LCT, such height variance between developments is insignificant. While rotational speed can be noted as being different between developments, it is understood and seen through numerous site visits that the rotational speeds within the array of Drumderg Wind Farm (as in multiple turbine developments) varies due to local conditions. Some blades can appear static while others turn at differing speeds. Any variance between developments will not be significant. This significance lessens further in views over 10km from site.
Drumderg Wind Farm	67m	80m	107m	5-13 rpm	

*See Appendix, Figures 3 through 12.

The rotational speed of the turbines vary between developments, however the figures are calculated as the worst case (theoretical) scenario and do not truly represent how the turbines operate on a daily basis.

Model of turbine (Gamesa™ G-58) has been specifically chosen for the proposed development location due to the lower wind speed at The Corb site. The larger 58m diameter blades capture more wind energy and allow the turbine to operate efficiently in lower wind speed environments.

The variation in average wind speed (Table 2.5) at the proposed developments (excluding obvious microclimate variations evident at any multi-turbine development) will ensure that the rotational speed of the blades of each turbine will be similar and unlikely to be distinguishable due to the number of turbines in operation within key visual envelopes.

The Siemens™ turbines of Drumderg, with their higher average wind speed will be operating close to their maximum rotational speed, whereas the Gamesa™ turbine of The Corb will be operating at the lower end due to the lower wind speed. This will lead to an indistinguishable difference between the two typologies.

TABLE 2.5: AVERAGE WIND SPEED DATA FOR PROPOSED CORB DEVELOPMENT AND EXISTING DRUMDERG

Development	Windspeed 10m AGL	Windspeed 25m AGL	Windspeed 45m AGL
The Corb	6.4m/s	7.2m/s	7.9m/s
Drumderg Wind Farm	7.6m/s	8.2m/s	8.8m/s

- Sensitivity of Combination Views to additional development: *Medium*.
- The overall magnitude of impact on Combination Views: The development will have *slight* impact in combined views within the landscape.
- Significance of effect on Combination Views: *Moderate/Minor* - the proposed scheme will have a non-significant adverse effect on receptors.

iv. Succession Views

These views will be most prominent from tourist receptors or elevated and/or lowland positions where a user in one location may get the feeling of being extensively surrounded by wind energy development.

As is identified by the cumulative ZTV (*see Appendix, Figure 1*), the greatest scope for viewing the proposed development in successional (rotational) views with other wind technology development occurs from the upper elevations of the Highland Foothills along the northern fringe of Strathmore (north of Blairgowrie and Alyth) where Sidlaw Hills developments: Ark Hill [03/00831/FUL]; Govals [12/00570/EIAL]; Frawney [12/00577/EIAL]; and Dodd Hill [12/00570/EIAL] may be viewed to the southeast and south while developments of: Drumderg [03/01917/FUL]; Tullymurdoch [12/01423/FLL]; Bamff [12/00963/FLL]; and Welton of Creuchies [TCP/11/16(121)] may be viewed to the northwest and west. Given distance and intervening topographic form of the foothills to summits & plateaux landscapes, the proposed development (if glimpsed in views) is read as a minor addition to the array of Drumderg. As is shown by photomontage visualisation No. 6 (*see Appendix, Figure 8a*), from the recognised upland walking area of Hill of Alyth (and lower Cateran Trail) the impact to succession views from the Highland Foothills is negligible. From the slopes and upper elevations of the Highland Summits and Plateaux landscape and Highland Fault Line, and as shown by photomontage and wireframe visualisations No's. 1, 4 and 10 (*see Appendix, Figures 3a, 6a and 12*), for upland hill walkers the percentage of views affected by development is slight and The Corb proposal is viewed at distance and predominantly as part of the array of Drumderg in impacted views. Significance of effect is moderate/minor.

- Sensitivity of Succession Views to additional development: *High*.
- The overall magnitude of impact on Succession Views: The development will have *negligible* impact in successional views within the landscape.
- Significance of effect on Succession Views: *Moderate/Minor* - the proposed scheme will have a non-significant adverse effect on receptors.

v. Sequential Effects

Main Tourist Routes identified in Supplementary Planning Guidance (SPG) for Wind Energy Proposals in Perth & Kinross (2005), guidelines 1 and 3, which should be afforded maximum protection from negative impacts are: M90, A826, A822, A827, A85, A9, B8019, and B846. Sensitivity due to nature of moving receptors is medium.

- M90 (Inverkeithing to Perth) – Given distance, intervening land-use and topography, and as shown by the ZTV (*see original LVIA Appendix, Figure 1*) the magnitude of impact caused by proposed development is negligible. Significance of effect is minor.
- A826 (Aberfeldy to A822) – As shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor is not impacted by proposed development. Significance of effect is none.
- A822 (Greenloaning to Inver) – As shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor is not impacted by proposed development. Significance of effect is none.
- A827 (Lix Toll to Ballinluig) – As shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor is not impacted by proposed development. Significance of effect is none.
- A85 (Oban to Dundee) – As shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor, for the most part, is not impacted by proposed development. There is the scope for limited views to development from Huntingtower area of Perth, but given distance, intervening land use and topography, such impact would be negligible. Significance of effect is minor/none.
- A9 (439km Falkirk Council area to Thurso) – This roadway corridor is a main tourist link known as “The Spine of Scotland.” As is shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor is not greatly impacted by the proposed development. Significance of effect is minor to moderate/minor.
- B8019 (Pitlochry by-pass to B846) – As shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor is not impacted by proposed development. Significance of effect is none.
- B846 (Aberfeldy to Rannoch Moor) – As shown by the ZTV (*see original LVIA Appendix, Figure 1*), this corridor is not impacted by proposed development. Significance of effect is none.

Specific studies requested by Perth and Kinross Council:

- A94 (Trunk road between Perth and Forfar: Approx. 43.5km) –
 - Travelling from Perth to Forfar along the A94, users experience a diverse range of enclosed to panoramic views incorporating: urban settlement; urban fringe; strath agricultural land (medium to large scale prime arable) leading on to upland livestock grazing and unimproved upland heath/moor with sporadic commercial plantation forestry (Highland Foothills to the north, Igneous Hills to the south); estate land with mature deciduous policy woodland; meandering middle course river valley and plain; and aspects to distant uplands and the Highland Boundary Fault line of impressive mountain terrain.
 - Wind farming is evidenced within the upper landscape character types skirting the Broad Valley Lowland (Strathmore) in which the A94 corridor sits. As highlighted in the ZTV (*see original LVIA Appendix, Figure 1*), the proposed Corb development would be

evidenced from a 1.5km section north of Perth Airport, heading northeast to the village of Balbeggie; a 7.8km section, 1km north of Balbeggie to the northern fringe of Burrelton, again heading northeast; and a 5.3km section from the A90 junction (Forfar) heading southwest towards Glamis. This represents a potential impact to approximately 33.5% of the overall distance between Perth and Forfar, though the ZTV and wireframe visualisations prepared (*see Appendix, Figure 15*) are limited to topographic constraints only and do not factor in above ground elements of natural and man-made structures (tree cover, hedges/walls and settlement) which skirt this roadway corridor, breaking views to development. Through these sections of impacted roadway views, any sighting of the proposed development, read in combination with area wind farming (Drumderg – existing; Welton of Creuchies – approved; Tullymurdoch – pending; and Bamff – pending) are at an oblique angle to direction of travel, are distant (+8km at nearest point to road) and are intermittent in nature (maximum time of visibility being 55 seconds with minimum break between views of 10 seconds). This is a fast road with sustained 60mph (dropping to 30mph through settlement). Significance of effect can be classed as *Moderate/Minor*.

- A93 (Perth to Aberdeen: Approx. 177km) –
 - Travelling from Perth to Aberdeen along the A93, users experience a highly diverse range of open panoramic views to enclosed, valley settings - views incorporating: urban settlement; urban fringe; strath agricultural land (medium to large scale prime arable) leading on to upland livestock grazing and unimproved upland heath/moor with commercial plantation forestry (Highland Foothills and lower slopes of Highland Summits and Plateaux); estate land with mature deciduous policy woodland; meandering middle course river valley and plain (Strathmore); Lower, Mid and Upper reaches of the Highland Glen character types; and aspects to distant uplands and the Highland Boundary Fault line leading to passage through the impressive large scale Highland landscape.
 - Greatest potential impacts for combined views of wind farm development exist from Strathmore locations travelling from Broad Valley Lowland towards the Highland Foothills before entering the Lower Highland Valley of the River Ericht at Blairgowrie. An intermittent 6.8km section from Stormontfield to the River Isla bridge area at the Woodside road junction would afford views of the proposed development, read in combination with area wind farming (Drumderg – existing; Welton of Creuchies – approved; Tullymurdoch – pending; and Bamff – pending) with direction of travel generally towards development. These turbines would be seen in two groupings with proposed development slightly offset from existing Drumderg while Tullymurdoch, Bamff and Welton of Creuchies are visually grouped further east along the hill line. The ZTV and wireframe visualisations prepared (*see Appendix, Figure 16*) are limited to topographic constraints only and do not factor in above ground elements of natural and man-made structures (tree cover, hedges/walls and settlement) which skirt this roadway corridor, breaking views to development. Any intermittent baseline views to the proposed development from these locations are not greatly impacted given distance (+/-20km), back-dropping by topography and the diverse nature of panoramic

views that are afforded road users. Through Highland Valley sections, both north and south and as shown in the wireframe visualisations, the proposed Corb turbine when viewed is regularly associated with the existing Drumderg Wind Farm. For the majority of impacted sections of the roadway corridor between Craighall and the Cray road junction, only blade of proposed development would be seen additionally in views. Given the undulating and winding nature of this roadway section and with speed of travel (40-60mph), any intermittent views of development are seen for a maximum of 30 seconds with intervals at minimum 20 seconds. Majority of views to existing Drumderg and proposed development are at an oblique angle to direction of travel. Significance of effect can be classed as *Moderate/Minor*.

- Sensitivity of Sequential Views to additional development: *Medium to High*.
- The overall magnitude of impact on Sequential Views: The development will have *slight to negligible* impact on sequential views through the landscape.
- Significance of effect on Sequential Experiences: *Moderate/Minor* - the proposed scheme will have a non-significant effect on moving receptors through impacted roadway corridors.

vi. Predicted Cumulative Visual Impact

Operational Stage

The following discussions are on the predicted visual impacts when the turbine is fully constructed, operational and viewed within the baseline landscape along with wind farm technology. The viewpoints listed relate to the equivalent photomontages and wireframe diagrams in the Appendix (*Figures 3 through 12*). These prepared graphics are additional to visualisations and wireframes submitted previously for application [12/01934/FLL].

TABLE 2.6: VISUALISATION CRITERIA

Camera	Fujifilm Finepix HS20 EXR digital.
Focal Length	50mm
Aspect Ratio	Original photography set at 4:3 (A3 – 400mm x 250mm) New photography set at 3:2 (A3 – 360mm x 240mm)
Viewing Distance	550mm

Photomontage 1: From Knock of Balmyre Hill (Hill of Persie); Facing in an Easterly direction

This represents views from the hilltop and crests within the Mounth Highlands and Highland Foothills to the west of the proposed development site taking in quite a varied array of visual stimuli for the upland moor location. The landform provides interest with lower lying valleys containing patches of deciduous forestry along river and stream courses interspersed with improved and semi-improved grazing land, sporadic single and small groupings of established settlement. Plateaux areas of expansive heather and semi to unimproved grassland give way to large tracts of dark coniferous plantation forestry with felling operations evidenced on the whale-backed hills. The more dramatic forms of the Mounth Highlands provide the backdrop to many views to the north, east and west with more open carse evidenced to the far south. Large scale wind energy structures are evidenced in the open, undulating land form.

The development at The Corb would be evidenced in conjunction with the existing structures of Drumderg. The wind farm turbines (No's. 12, 13 and 14) which form a linear array out of the otherwise compact grid formation extend towards The Corb. The addition of The Corb turbine does not provide an impact out of scale or at odds to this formation. The upper tips of proposed Bamff Wind Farm are evidenced just over the ridge of moorland within the next landscape character type.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be walkers within the foothills and greater highlands area (Not clear designated trails);
- The magnitude of impact: *Slight* impact to existing views;
- Significance of effect on visual amenity from this vantage point: *Moderate/Minor*.

Photomontage 2: From the B950 Pitlochry Road; Facing in an Southeast direction

Views along this scenic route take in the many varied forms of the Highland Summit and Plateaux, Highland Glens and Highland Foothills landscapes, following the undulating form of the valley between the A93 and Kirkmichael. This landscape includes agricultural activity in the valley bottom and extensive plantation forestry operations on the slopes and crests/summits of the lower lying foothills. The smaller scale landscape of the more enclosed valley often opens up to the medium scale of distant hills and the larger scale of more distant highland mountains. Large scale wind farm activity is evidenced when travelling in a southwest direction from Kirkmichael to the A93. From this section of roadway, the upper blade tips and occasional hub and blades of Drumderg Wind Farm are viewed above the distant crest of hill, seen above forestry clearance operations.

The development at The Corb would be viewed as part of this array. Variations in hub height within the wind farm are evident and expected due to the variations in topography experienced on the moor. The Corb turbine, seen alongside these existing turbines within the scale of the landscape (and impacting only a small scale of it) does not provide a significant impact at odds to the baseline landscape, its existing amenity or moving receptors within.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be local and tourist road users;
- The magnitude of impact: *Negligible to slight* impact to existing views. The proposed development would be visually read as part of the existing wind farm (Drumderg), without significantly increasing the existing impact or effect of this development;
- Overall degree of effects on visual amenity from this vantage point: *Minor to Moderate/Minor*.

Photomontage 3: From the A93 at Glenshee Pottery⁵; Facing in an Southerly direction

Views along this scenic route take in the many varied forms of the wider Landscape Character Types and Areas, passing through stages of valley corridors and allowing views of – and through – the Highland Foothills to the Highland Summits and Plateaux. The road is heavily undulating and winding in nature with distant views tending to be relatively short and often interrupted by landform and valley vegetation. Views, for the most part, towards the existing Drumderg Wind Farm are screened from both directions by the topography and orientation. The valley side and elevation changes shield road users from significant impacts of the turbines.

Road users travelling south at the point of the A93 at Cray may experience a glimpse of the proposed Corb turbine as slight blade tip seen over the crest of the moor rising from the valley. Given the heavily undulating and winding nature of the road for the majority of this 5km section, such views are not significantly impacted by development. Upon passing the junction of the B950 where any views would be at an oblique angle, significance of impact becomes less.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be local and tourist road users;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Minor adverse*.

⁵ Glenshee – Glen of the Fairies, Glenshee Pottery & Visitor Centre, <http://www.glenofthefairies.co.uk/Glenshee-Pottery-and-Visitor-Centre-g.asp>

Photomontage 4: From Creigh Hill by Backwater Reservoir; Facing in an Westerly direction

Views from this hilltop take in a wide panorama including the rolling and plateaux forms of the foothills with valleys and the whale-backed hills incorporating significant areas of dark commercial coniferous plantation forestry contrasting against expansive areas of heather and semi-improved to unimproved grassland (livestock grazing). A wider view to the further dramatic Highland forms is evidenced. Large scale wind energy structures (Drumderg) are viewed in the open, undulating land form, though from this degree of elevation they are not dramatically sky-lined, tending to be back dropped by the mountain forms beyond. Uninterrupted and un-impacted views of the dramatic Highlands are seen to the east through to the northwest.

The development at The Corb would be seen in combination with the array of Drumderg Wind Farm in these westerly views. Variations in hub height within the existing wind farm are evident and expected due to the variations in topography experienced on the moor. The Corb turbine, seen alongside these existing turbines within the scale of the landscape (and impacting only a small percentage of rotational views from this upland area) does not provide a significant impact at odds to the baseline landscape, its existing amenity or upland walkers therein.

- The visual sensitivity of the visual receptor: *Medium to High* as the receptors will mainly be walkers within the foothills and greater highlands area (few designated trails);
- The magnitude of impact: *Slight* impact to existing views. The proposed development would be read in the context with the existing wind farming activity (Drumderg), without significantly increasing the extent of the physical footprint and viewed over large forestry operations;
- Overall degree of effects on visual amenity from this vantage point: *Moderate/Minor*.

Photomontage 5: From Kinpurney Hill; Facing in a Northwest direction

Views from this hilltop take in a wide panorama looking over the Broad Valley Lowland of Strathmore to the opposite rolling Highland Foothills, the Highland Summits and Plateaux beyond and the dramatic skyline of the Highland Boundary Fault (seen as an extensive mountain range from the northeast to the west. The eye is drawn to many varying stimuli inclusive of the rich tapestry of strath farmland interspersed with tracts of deciduous policy woodland and settlement. Foothills are seen blanketed in part with dark commercial coniferous forestry, contrasting with lighter moorland and grazing land. Medium scale pylon infrastructure is evidenced in the strath, while wind farm activity (Drumderg) is evidenced within the summits landscape, back-dropped by the Highland Boundary Fault.

The development at The Corb would be seen in combination with the array of Drumderg Wind Farm in these northwest views. The approved Welton of Creuchies development along with Tullymurdoch and Bamff Wind Farms (both in planning) extend the footprint of wind farming along the fault line, however by proximity to Drumderg, such impact is not resultant from The Corb proposal. Any variations in turbine typology are not significant from this distance or elevation.

- The visual sensitivity of the visual receptor: *Medium to High* as the receptors will mainly be walkers within the Sidlaw Hills;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Minor to Moderate/Minor*.

Photomontage 6: From Hill of Alyth; Facing in a Northwest direction

Views from this popular local walking area take in a varied panorama of rolling foothills and peaks of the Highland Boundary Fault from the west to the northeast and the Broad Valley Lowland of Strathmore over the market town of Alyth from the east to the southwest incorporating the range of the Sidlaw Hills beyond. Within the foothills valleys, pockets of mature deciduous woodland are evidenced, while on the lower slopes of these hills are blankets of dark commercial plantation forestry. There is an array of colour and texture provided by this forestry and heather moorland set against unimproved acid heath grassland and improved grazing pasture land. Farmsteads and sporadic settlement are also evidenced within the landscape framework. Large scale wind farming activity (Drumderg) is fairly dominant in northwest views on the moor. Part of development is seen back-dropped against the highland peaks, while part is sky-lined.

The development at The Corb would be seen in combination with the array of Drumderg Wind Farm in these northwest views. Such impact of the single turbine in combination from this vantage point is negligible. Bamff Wind Farm (in planning) provides an open array in contrast to Drumderg's close grid formation which extends the presence of the larger typology structures into the foothills, though some are back-dropped by the distant topography.

- The visual sensitivity of the visual receptor: *Medium to High* as the receptors will mainly be local walkers and tourist visitors;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Minor to Moderate/Minor*.

Photomontage 7: From the A94 at Longley; Facing in a Northwest direction

One of the areas along the A94 roadway corridor where the contrast in the landscape character types (Broad Valley Lowland; Highland Foothills; Highland Summits and Plateaux) combine to frame the view from the lower valley towards existing Drumderg Wind Farm. This is indicative of views from local residents at Longley, road users (view is perpendicular to direction of travel) and motorists stopped at the available lay-by.

The development at The Corb would not be seen for large sections of this corridor given the nature of the intervening foothills landscape from the lowland setting. Of all proposed and existing development, the existing form of Drumderg and Welton of Creuchies (approved) would provide the cumulative impact from this vantage point. Proposed Corb, Tullymurdoch and Bamff labels are shown in visualisation to highlight locations behind the line of hills.

- The visual sensitivity of the visual receptor: *Medium* as the receptors will mainly be road users;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Minor (None)*.

Photomontage 8: From Hallyburton Community Woodland; Facing in a Northwest direction

Views from this popular walking area take in a wide panorama looking over the Broad Valley Lowland of Strathmore to the opposite rolling Highland Foothills, the Highland Summits and Plateaux beyond and the dramatic skyline of the Highland Boundary Fault (seen as an extensive mountain range framed by the form of the surrounding Sidlaw Hills). The eye is drawn to various stimuli including foreground forestry, rolling pasture land, valley policy woodland and farming framework/patterns. Foothills are seen blanketed in part with dark commercial coniferous forestry, contrasting with lighter moorland and grazing land. Wind farm activity (Drumderg) is evidenced within the summits landscape, back-dropped by the Highland Boundary Fault.

The development at The Corb would be seen in combination with the array of Drumderg Wind Farm in these northwest views. The approved Welton of Creuchies development is seen in this grouping. Tullymurdoch and Bamff Wind Farms (both in planning) create a grouping further east which extends the footprint of wind farming along the fault line, however by proximity to Drumderg, such impact is not resultant from The Corb proposal. Any variations in turbine typology are not significant from this distance or elevation.

- The visual sensitivity of the visual receptor: *Medium to High* as the receptors will mainly be road users and walkers within the Sidlaw Hills;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Minor to Moderate/Minor*.

Photomontage 9: From Burrelton – Primary School; Facing in a North direction

Views from this strath town towards the north take in the broad lowland form of the valley with open arable land bordered by post/wire fencing giving an expansive scale interspersed with mature mixed and deciduous policy woodland. The whale-backed forms of the highland foothills, blanketed in areas of dark commercial plantation forestry give way to the more dramatic forms of the Highland Boundary Fault in the far distance. The existing wind farm of Drumderg is evidenced on the moor within the highland summits and plateaux over the foothills, though at just over 20km distance, this does not dominate or significantly affect residential amenity.

The development at The Corb would be seen in close proximity to the array of Drumderg Wind Farm in these northerly views. Given distance and form of Drumderg along the foothills crest, the positioning of the Corb development presents no significant cumulative impact or adverse clutter on baseline conditions. As such, its presence with existing infrastructure does not impact residential amenity to a significant degree. The approved Welton of Creuchies development along with Tullymurdoch and Bamff Wind Farms (both in planning) create a more open grouping further east which extends the footprint of wind farming along the fault line.

- The visual sensitivity of the visual receptor: *High* as the receptors will mainly be residents;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Moderate/Minor*.

Wireframe 10: From Ben Vrackie, Pitlochry; Facing in a Southeast direction

Ben Vrackie is a popular walking hill (Corbett) located behind the picturesque and historical highland tourist town of Pitlochry. Given current sustained adverse weather conditions for optimum photography, the submitted visualisation has been prepared as a wireframe drawing only to show context of the proposed project in the greater landform and relative to existing and proposed wind energy development from this elevated position located at just under 22km from site.

The development at The Corb would be seen in close proximity to the array of Drumderg Wind Farm in these south-easterly views. Given distance and intervening topography, this combined view presents no significant cumulative impact, and any variance in typology or rotational speed would be negligible to the eye. From this vantage point the developments of The Corb (proposed), Drumderg (existing), Tullymurdoch and Bamff (both in planning) are seen as a unified array, while the low impacting Welton of Creuchies (approved) grouping is seen apart.

- The visual sensitivity of the visual receptor: *High to Medium* as the receptors will mainly be tourists and hill walkers;
- The magnitude of impact: *Negligible* impact to existing views;
- Overall degree of effects on visual amenity from this vantage point: *Moderate/Minor*.

II. Summary of Findings (Overall Effect) of Cumulative Impacts

The potential for cluttering within the landscape from the Corb development with other wind energy projects within the Highland Summits and Plateaux landscape and adjacent neighbouring landscape types is mediated by introducing a single turbine development of a suitable scale into a wind farm impacted local landscape in such a way that physical footprint is not greatly increased and proposed development does not look at odds with existing structure to users of the landscape.

From upland areas multiple development will be evident in the form of large scale wind farming, but the smaller developments by dint of scale, separation distance and the form of intervening landscape (larger scale upland, rolling foothills, intimate valleys and wider lowland strath) do not provide a cumulative massing of wind technology deemed inappropriate for the scale of the landscape or the users therein.

- The overall magnitude of Cumulative Impact: The development will have *slight* cumulative impact with other wind technology development within the landscape.
- Significance of Cumulative Effect: *Moderate/Minor*. The proposed scheme will have a non-significant effect on receptors when viewed with other wind technology development within the landscape.

The determination of *moderate/minor* effect (and under) on landscape and landscape amenity is non-significant as specified in The Environmental Impact Assessment (Scotland) Regulations, 1999 (Circular 8, 2007)⁶.

⁶The Environmental Impact Assessment (Scotland) Regulations, 1999 – Circular 8 (2007)
<http://www.scotland.gov.uk/Resource/Doc/205337/0054660.pdf>

Perceived Cumulative Effects

SNH guidance, “Assessing the Cumulative Impact of Onshore Wind Energy Development (2012)”⁷ Paragraph 57 states:

53. Perceived cumulative effects may arise;

*- Where two or more developments are present but one or more is never seen by the observer, for example, because they are screened, or the observer is unable or unwilling to gain a viewpoint from where they would be seen. The observer is aware that other developments are present because, for example, they may have learnt about them or seen signs to them. **This effect may be significant, but can also be mistaken, where the observer's information or interpretation of it is wrong;** or*

- Where people have formed an opinion about wind farms generally without having seen one, for example through someone else's experience. They may use this perceived effect to express a negative opinion about a development proposal near where they live.

*54. Few detailed perception studies have been undertaken to date and **although there is a generally good understanding among planners and Local Authority councillors of perceived effects, it is unusual for them to be considered in the context of an individual decision.** This issue is therefore most appropriately addressed within the scope of strategic environmental assessment or spatial planning.*

Setting Precedent

There is often a spoken or unspoken belief among regulatory authorities when determining wind energy development that to allow a suitable development to be approved on its merits will set a precedent in that area for possible unsuitable development.

While in Scottish legislation this unreasonable approach to planning determination is not addressed, in other renewable energy legislation within the UK, precedent is recognised as an inappropriate planning justification and as such is not allowed as an argument or material planning consideration. In England, “Planning for Renewable Energy (A Companion Guide to PPS22)” states:

*39. The planning system exists to regulate the development and use of land in the public interest. The material question is whether the proposal would have a detrimental effect on the locality generally, and on amenities that ought, in the public interest, to be protected. **Each planning application should be considered on its own merits, and the argument that granting permission might lead to another application is not sufficient grounds for refusal.***

⁷Office Of the Deputy Prime Minister, PPS22,
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7779/147447.pdf

3. **GUIDANCE AND POLICY**

I. **Local Planning Guidance**

Supplementary Planning Guidance (SPG) for Wind Energy Proposals in Perth & Kinross (2005)

The proposed development site lies within a “**Broad Area of Search**” designation as identified in the SPG and Diagram 1 of the SPG.

Commercial and Community Wind Energy Schemes

7.3 The policy makes a distinction between two types of wind energy development which require different policy responses; community schemes and commercial schemes. The classification below is used within the following policy:-

Table1: Scale of Development

Type	Scale	Example
Community	Domestic	Single small turbine (typically up to 7m hub height, and blade diameter of 4m)
	Single	Single ‘standard’ turbine (typically more than 20m to hub height and blade diameter more than 20m)
	Cluster	2-5 turbines (typically no more than 30m from ground to blade tip) in a single installation
Commercial	Cluster	2-5 turbines (up to 120m from ground to blade tip) in a single installation
	Wind Farm	6 or more turbines (up to 120m from ground to blade tip) in a single installation

Scale of proposed development: Type - Community, Single.

➤ WIND ENERGY POLICY 1:

- *The Council will encourage the development of commercial wind energy schemes which assist in achieving the Scottish Executive's target of electricity generated from renewable sources by 2010 (sic.) and also community wind energy schemes to provide local electricity needs in locations least damaging to landscape character, amenity, habitats, and species in Perth & Kinross as shown in Diagram 1. In the period up to 2010 (sic.), the Council will look favourably on those schemes within the 'Broad Area of Search' which meet the criteria set out in the Council's Wind Energy Policy Guidelines. The Council will work, in conjunction with public agencies and the private sector, to ensure that Perth & Kinross makes an appropriate contribution to meeting the Scottish Executive's 40% (sic.) aspirational target of electricity generated from all renewable sources by 2020. The contribution to be made by Perth & Kinross to this target will be subject to a later review as wind energy schemes are implemented and other technologies come forward.*

➤ WIND ENERGY POLICY 2:

*In the Broad Area of Search, Community and Commercial wind energy developments (see Table 1) 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, and are in locations least damaging to settlements, landscape character, visual amenity, habitats, and will not have unacceptable cumulative impacts.***

- *POLICY GUIDELINE 1: Wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse impact which cannot be mitigated. A commercial or community wind farm or cluster is unlikely to be acceptable on prominent ridges, hills or sensitive skyline locations in or within 5km of any of the sensitive locations listed below unless it is demonstrated to the satisfaction of the Council that the impact will be slight or not significant.*

Design Measures

Effects on landscape character can be minimised by use of appropriate:

- ***Siting in relation to other wind farms***
- ***Selection of appropriate landscape***
- ***Size of turbine***
- ***Number of turbines***
- ***Location of turbines in relation to landform and landscape characteristics***
- ***Positioning of turbines in relation to other turbines***
- *Siting and design of tracks, borrow pits, buildings and any power lines*
- *Colours and finishes*
- *Reinstatement*

Evaluation

Effects on landscape character will be evaluated in accordance with current best practice.

Sensitive receptors:

- *National Scenic Areas*
- *National Parks*
- *Historic Gardens and Designed Landscapes*
- *Perth Green Belt*
- *Areas of Great Landscape Value*
- *The views from major tourist routes (M90, A826, A822, A827, A85, A9, B8019, B846) as shown on Diagram 1*
- ***The views from popular public or representative viewpoints and paths as agreed with the Council***
- *Settlements*

Visualisations such as photomontages used to assist in the assessment of developments should use a full image size of A4 or A3 for a single frame picture, giving an image height of approximately 20cm to give a realistic impression.

- **POLICY GUIDELINE 2:** *Wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse visual impact which cannot be mitigated. 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, Scheduled Ancient Monuments, significant archaeological sites and their settings, Conservation Areas and Listed Buildings where no satisfactory assessment has been undertaken and where it has not been demonstrated, to the satisfaction of the Council, that the visual impact will be slight or not significant. Domestic-scale turbines will normally be acceptable beside existing buildings where visually and functionally related to and in proportion with them.*

Design Measures

Effects on landscape character can be minimised by use of appropriate:

- ***Siting of the wind farm in relation to significant receptor locations***
- ***Size of turbine***
- ***Number of turbines***
- ***Positioning of turbines in relation to sensitive receptors***
- ***Positioning of turbines in relation to other turbines***
- ***Siting and design of buildings and any power lines***
- ***Colours and finishes***

Evaluation

It will be particularly important to assess the effects on:

- ***Houses and settlements***
 - ***The setting of locally prominent landforms which contribute to the character of the locality***
 - *The setting of locally prominent and/or valued buildings, including Listed Buildings, which contribute to the character of the locality*
 - *The setting of Scheduled Ancient Monuments and significant archaeological sites*
 - *The character and setting of the National Parks*
- **POLICY GUIDELINE 3:** *Wind energy proposals will be encouraged except in locations where they will have a substantial or moderate adverse cumulative impact on important receptors. A commercial or community wind farm, cluster or turbine when located within 40km of another is unlikely to be acceptable where it has not been demonstrated, to the satisfaction of the Council, that the cumulative landscape and visual impact will be slight or not significant. The Council will encourage developers to co-operate over the exchange of information, where cumulative assessment has been identified as important and is needed in order to make such assessments.*

Design Measures

Impacts can be minimised by:

- ***Positioning of the wind farm and turbines in relation to landscape character and surrounding landform and other wind farms***

- **Positioning of turbines in relation to other turbines and wind farms**
- **Siting and design of the wind farm in relation to power lines**
- **Colours and finishes**

Evaluation

It will be particularly important to assess the effects on:

- *The views from major tourist routes (M90, A826, A822, A827, A85, A9, B8019, B846) as shown on Diagram 1*
- **The views from popular public viewpoints**
- **Settlements**

The duration, frequency and nature of combined and sequential views (glimpses or more prolonged views; oblique, filtered or more direct views; time separation between sequential views) should be assessed.

vii. Landscape Designations and Policy

In regards to natural heritage sensitivity, SNH have produced guidance as to which areas in Scotland have most scope for wind turbine development, and which have the most significant constraints.⁸ Three broad zones are identified:

Zone 1: Lowest natural heritage sensitivity (greatest opportunity for a large number of developments);

Zone 2: Medium natural heritage sensitivity (Some sensitivity, yet scope to accommodate development to an appropriate scale); and

Zone 3: High natural heritage sensitivity (Greatest constraint to development, some sites may be appropriate, yet full investigation into impact on natural heritage is likely to be required).

*The Corb is within the **lowest sensitivity (Zone 1)**.⁹ Zone 1 includes the 15% of Scotland's land area in which SNH considers that there is the greatest opportunity for development from a natural heritage standpoint. In general terms habitats, species and earth science interest within this area are of lowest sensitivity to wind farm development. Zone 1 encompasses many of the more managed landscapes and habitats modified by man, such as agricultural and commercially forested landscapes. Whilst cumulative impacts within this area are still important, it is appropriate for these areas in general to accept changes in landscape character in order to meet the needs of renewable energy generation. **It is important therefore to recognise that the inclusion of an area in Zone 1 does not imply absence of natural heritage interest. Good siting and design should however enable such localised interests to be respected, so that overall,***

⁸ SNH (2009) *Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage: Policy Statement No. 02/02*: <http://www.snh.gov.uk/docs/A247182.pdf>

⁹ SNH Map 5, Zones of Natural Heritage <http://www.snh.gov.uk/docs/C208975.pdf>

within Zone 1, natural heritage interests do not present a significant constraint on wind farm development.

Eastern Area Local Plan (1998)

The proposed turbine site **does not** lie within any specific or determined policy areas as identified by the Perth & Kinross Local Development Plan and area maps. There are **no** National, Regional or Local landscape designations covering the proposed site and the effects on Regional and National designations have been found to be acceptable given scale of development and distance to protected landscapes.

➤ POLICY 9 (Renewable Energy):

The Council will encourage, in appropriate locations, developments which contribute towards the Scottish Renewables Obligation. In the absence of a detailed Council wide policy on renewable energy production, developments will be assessed against the following criteria:-

- That provision can be made for construction traffic, without danger to road traffic safety or the environment.
- That the development will not have a significant detrimental effect on sites of nature conservation or sites of archaeological interest.
- That the development will not result in an unacceptable intrusion on the intrinsic landscape quality of the area.
- That the development will not result in a loss of amenity to neighbouring occupiers by reasons of noise emission, visual dominance, electromagnetic disturbance or reflected light.
- **The cumulative impact of having two or more windfarms in the same area will be considered.**

Policy 9 Analysis:

- Construction traffic and accessibility is in compliance with policy.
- No detrimental effect on nature conservation/archaeological sites as assessed. Compliance.
- Development is acceptable in terms of wind farm impacted landscape. No significant adverse impact to landscape character types or protected/designated landscapes as assessed. Compliance.
- No residences other than applicant's property to be effected by development within 2km of development site. No issues with noise, visual dominance, electromagnetic disturbance or reflected light/shadow flicker. No loss of residential amenity. Compliance.
- Development is not a wind farm, though is proposed adjacent to existing wind farm infrastructure. As a stand-a-lone development the proposal is acceptable in terms of cumulative impact as assessed. Compliance.

Proposed Local Development Plan (2012)

- POLICY ER1A (Renewable and Low Carbon Energy Generation – 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 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.*

Proposals for the development of renewable or low carbon sources of energy by a community may be supported where the development does not meet all of the above requirements provided it has been demonstrated that there will not be significant environmental effects and the only community significantly affected by the proposal is the community proposing and developing it.

ER1A Analysis:

- a) Individual effects have been proven to be non-significant in terms of scale of development and resultant impact. Cumulative effects on baseline landscape character, visual integrity and residential amenity are acceptable. Compliance.
- b) Satisfactorily contributes to local, regional and national targets. Compliance.
- c) Grid connection. Compliance.
- d) Full Traffic Management Plan will be submitted upon planning approval and turbine delivery approval. Compliance.
- e) Development impacts are in compliance.
- f) Development impacts are in compliance.
- g) Full information provided on Socio-Economic impacts and local applicant benefits. Compliance.
- h) Design Development set forth in full Environmental Report. Compliance.

Further:

The proposed development site, lying within the Highland Summits and Plateaux, and adjacent to the Highland Foothills Landscape Character Type is more readily absorbed into the scale of this landscape suitable for wind farm development.

Any significant adverse effects of the proposed single turbine development are negated by the presence of existing Drumderg Wind Farm. By carefully choosing a turbine of suitable typology, visual impacts are tied into the existing technology structure without expanding the footprint to a significant extent.

The proposed development, **as a local individual project**, will assist in meeting regional and national targets set for reducing carbon emissions; cumulatively with other suitably Council approved wind technology projects.

Electricity connectivity, transport infrastructure and access are all highly suitable for the scale of development.

As a diversification project in a rural location suitable for the scale and type of development, the local individual developer will be able to source income to the betterment of the local area from inward investment.







Within the constraints of the landowner/developer's property, the turbine location has been selected to address ecological concerns and to tie the turbine as closely from a visual standpoint to the existing wind technology development found in the landscape.

APPENDIX

- Figure 1:** Cumulative ZTV of The Corb 84m (to tip) turbine over a 35km Radius
- Figure 2:** Wind Turbine Developments within 35km of The Corb (Map)
- Figure 3:** Baseline Photograph and Wireframe 1: Knock of Balmyle Hill (Hill of Persie)
(3a) Photomontage
- Figure 4:** Baseline Photograph and Wireframe 2: B950, Pitlochry Road
(4a) Photomontage
- Figure 5:** Baseline Photograph and Wireframe 3: A93, Glenshee Pottery
(5a) Photomontage
- Figure 6:** Baseline Photograph and Wireframe 4: Creigh Hill
(6a) Photomontage
- Figure 7:** Baseline Photograph and Wireframe 5: Kinpurney Hill
(7a) Photomontage
- Figure 8:** Baseline Photograph and Wireframe 6: Hill of Alyth
(8a) Photomontage
- Figure 9:** Baseline Photograph and Wireframe 7: A94, Longley
(9a) Photomontage
- Figure 10:** Baseline Photograph and Wireframe 8: Hallyburton Community Woodland
(10a) Photomontage
- Figure 11:** Baseline Photograph and Wireframe 9: Burrelton – Primary School
(11a) Photomontage
- Figure 12:** Wireframe 10: Ben Vrackie, Pitlochry
- Figure 13:** Viewpoint Locator Map – 1:25,000
- Figure 14:** Viewpoint Locator Map – 1:200,000
- Figure 15:** A94 Roadway Study – Wireframe Diagrams (and 15a)
- Figure 16:** A93 Roadway Study – Wireframe Diagrams (and 16a, 16b)

Figure 1: Cumulative ZTV to 35km of The Corb, Bridge of Cally

Legend:

-  The Corb Turbine Location
E316389 N757051
-  1- 8 Turbines
-  9 - 17 Turbines
-  18 - 26 Turbines
-  27 - 35 Turbines
-  10, 20 & 35km Radius Areas

0 2 4 8 Kilometres

1:250,000

Ordnance Survey © Crown Copyright 2013.
All rights reserved. Licence number 100020449



Site Name: The Corb
Client: Mr N Bailey
Site Reference: WV1020
Drawing No: 010a
Date: 02/04/2013
Drawn by: chris.lockett



Waterside Farm
Glasgow K44 8PB
t: 01563 829999
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk

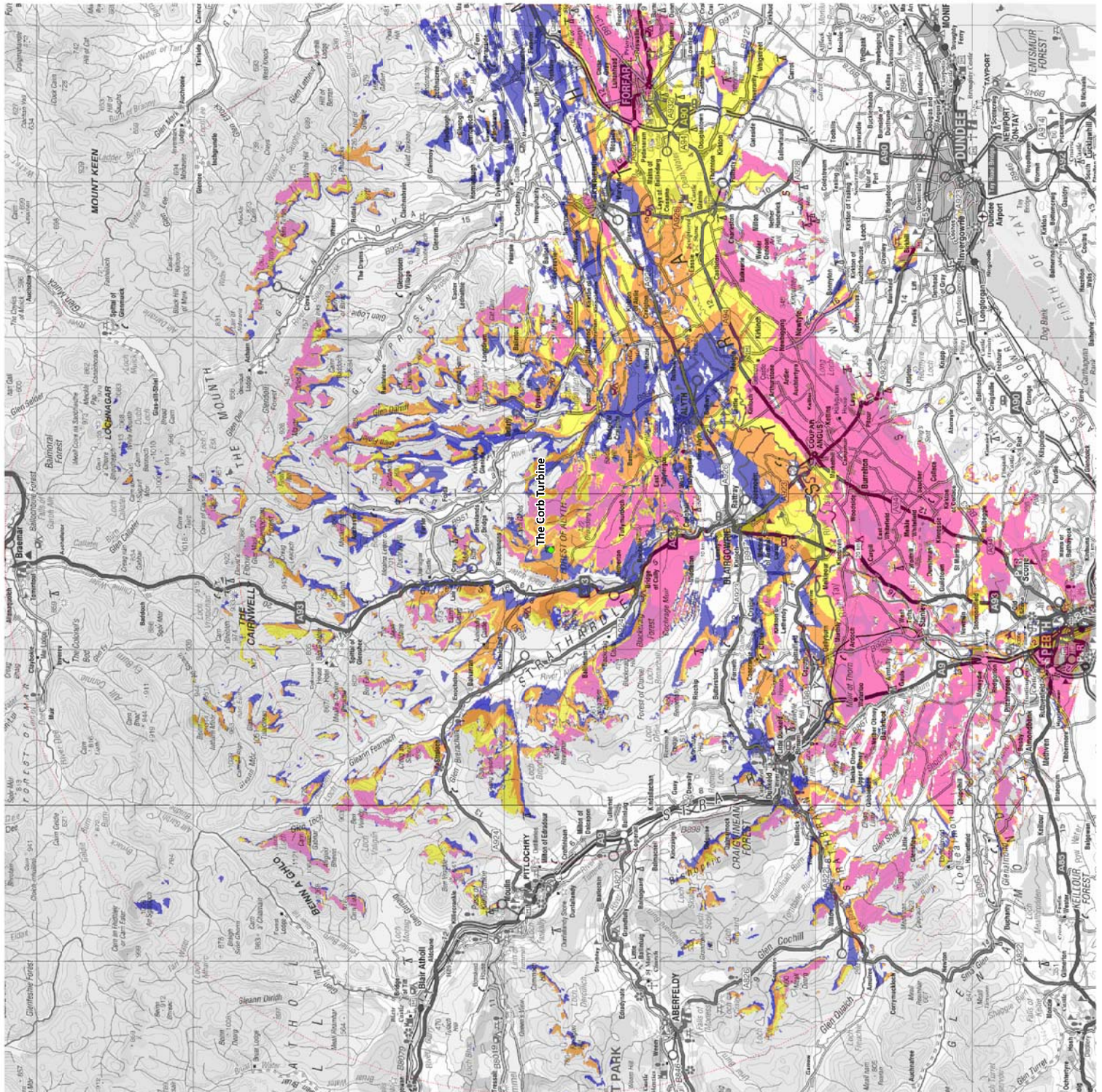
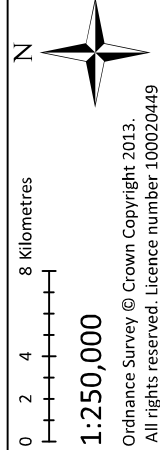


Figure 2: Wind Turbine Developments within 35km of The Corb, Bridge of Cally

Legend:

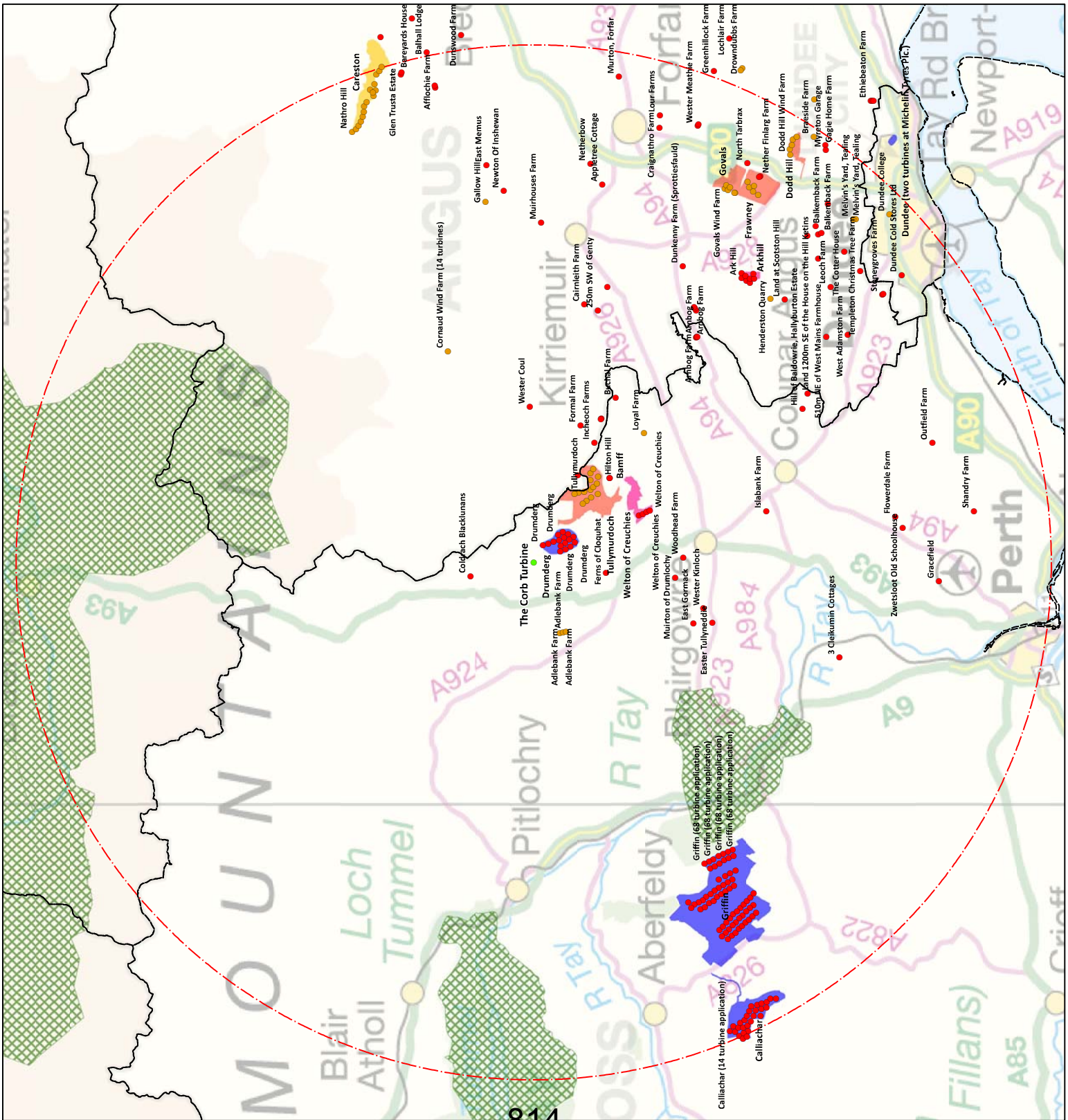
- The Corb Turbine Location E316389 N757051
- Turbine - Approved/Installed
- Turbine - Application/Pending
- Installed - Wind Farm Boundary
- Approved - Wind Farm Boundary
- Application - Wind Farm Boundary
- Scoping - Wind Farm Boundary
- 35km Radius Search Area
- National Scenic Area (NSA)

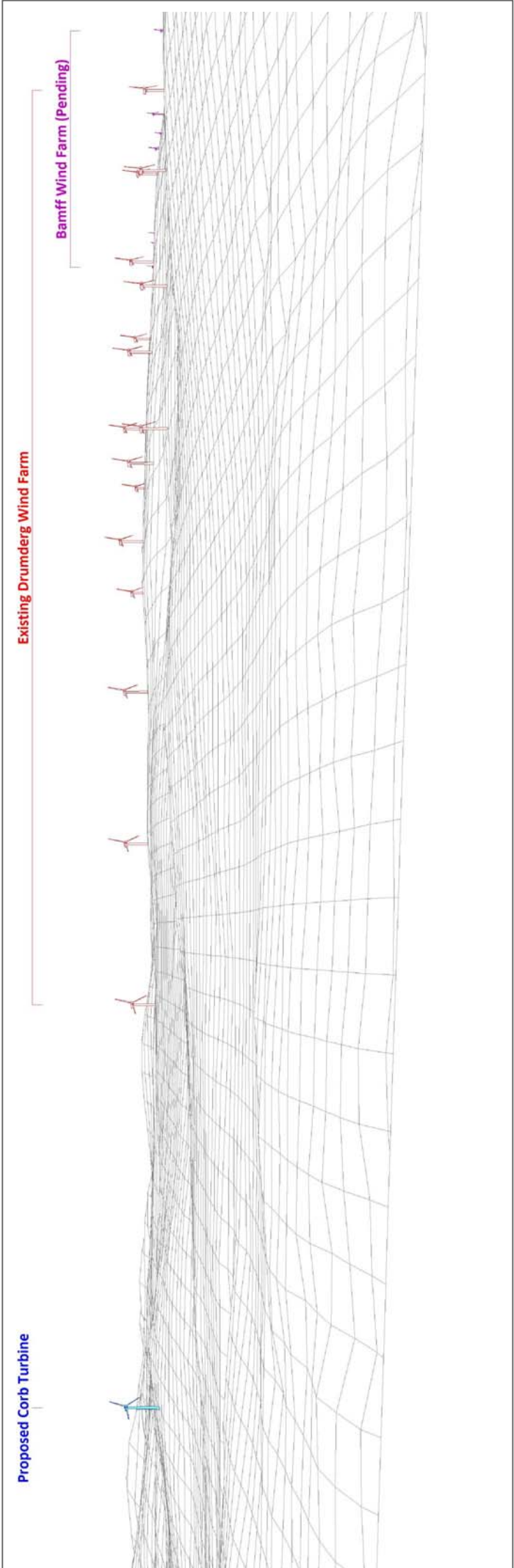
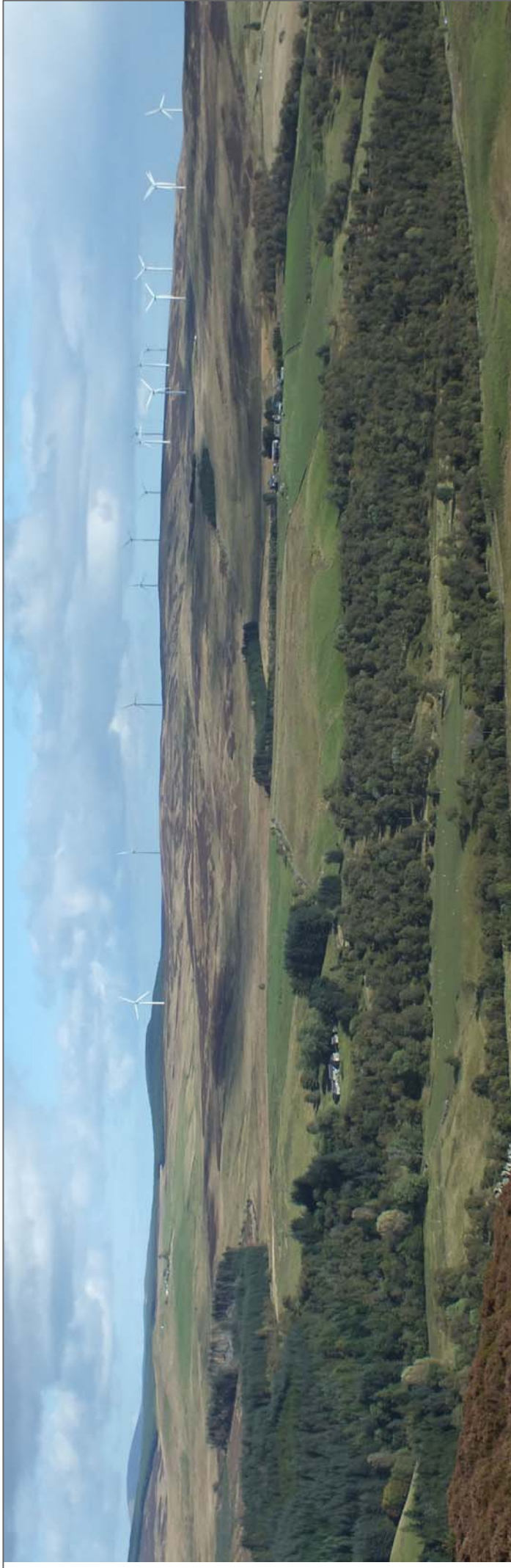


Site Name: The Corb
Client: Mr N Bailey
Site Reference: WV1020
Drawing No: 007b
Date: 29/03/2013
Drawn by: chris.lockett

VG ENERGY
Renewable Technology Specialists

Waterside Farm
Glasgow Road
Glasgow K44 8PB
t: 01563 829999
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk



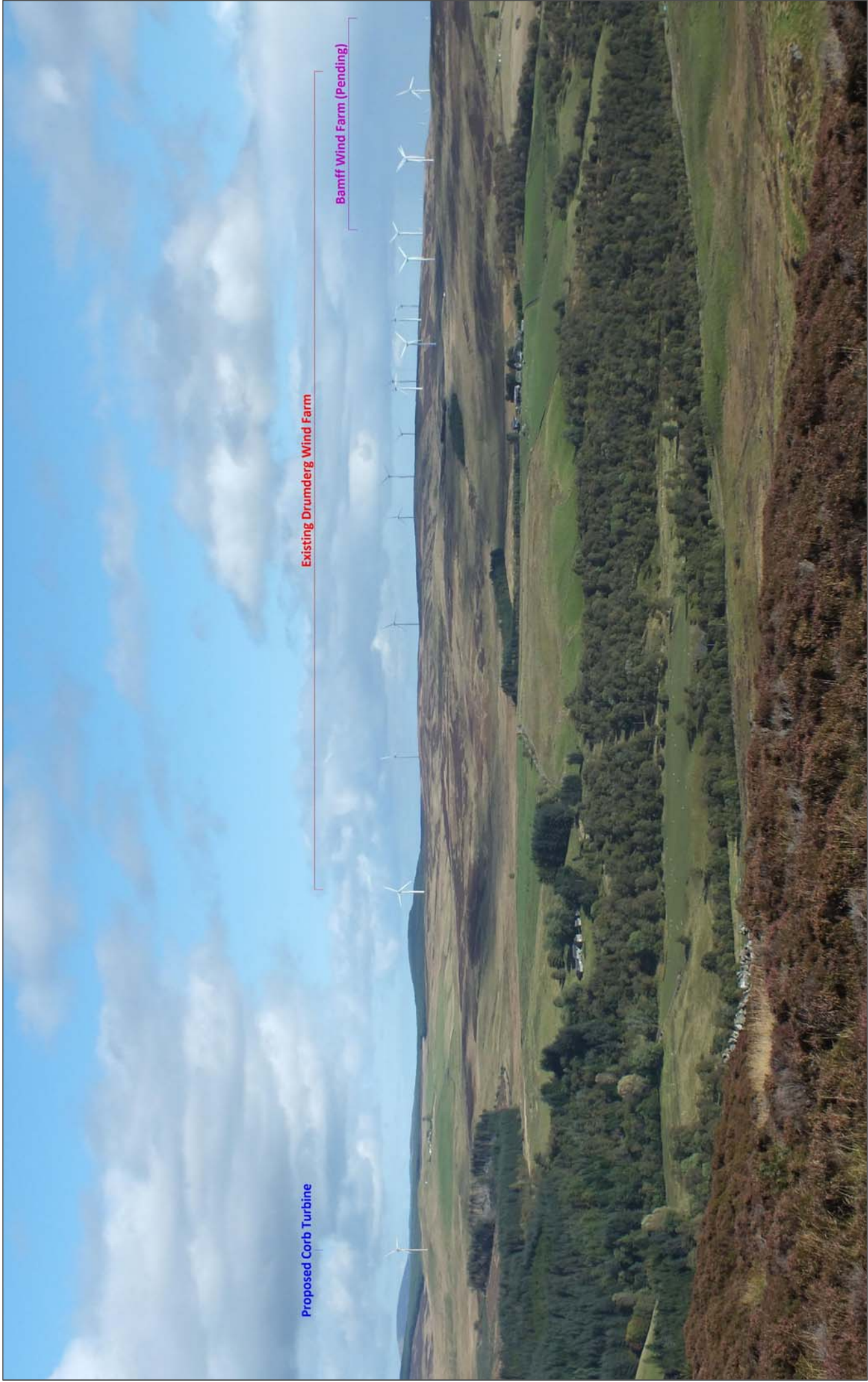


Baseline Photograph and Wireframe No. 1 (Figure 3)
The Corb (From Knock of Balmyle Hill)

Distance to turbine: 3.65km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

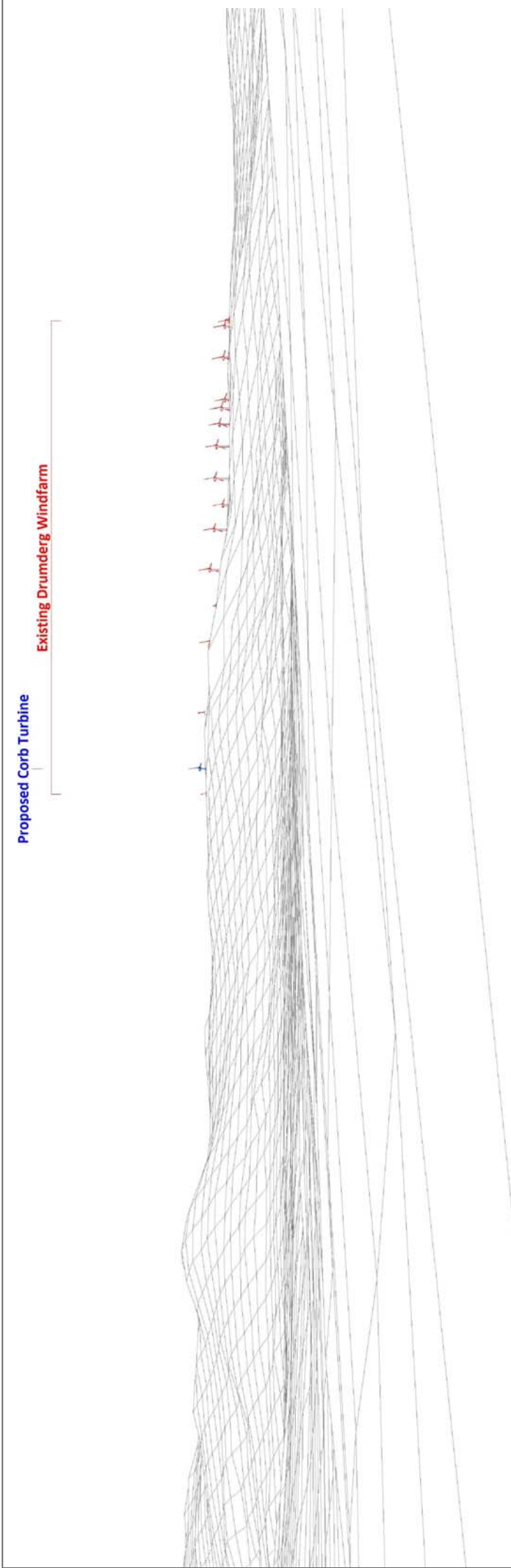
Date Photograph Taken: 28/09/12
Time Photograph Taken: 15:30



Photomontage No. 1 (Figure 3a)
The Corb (From Knock of Balmyle Hill)

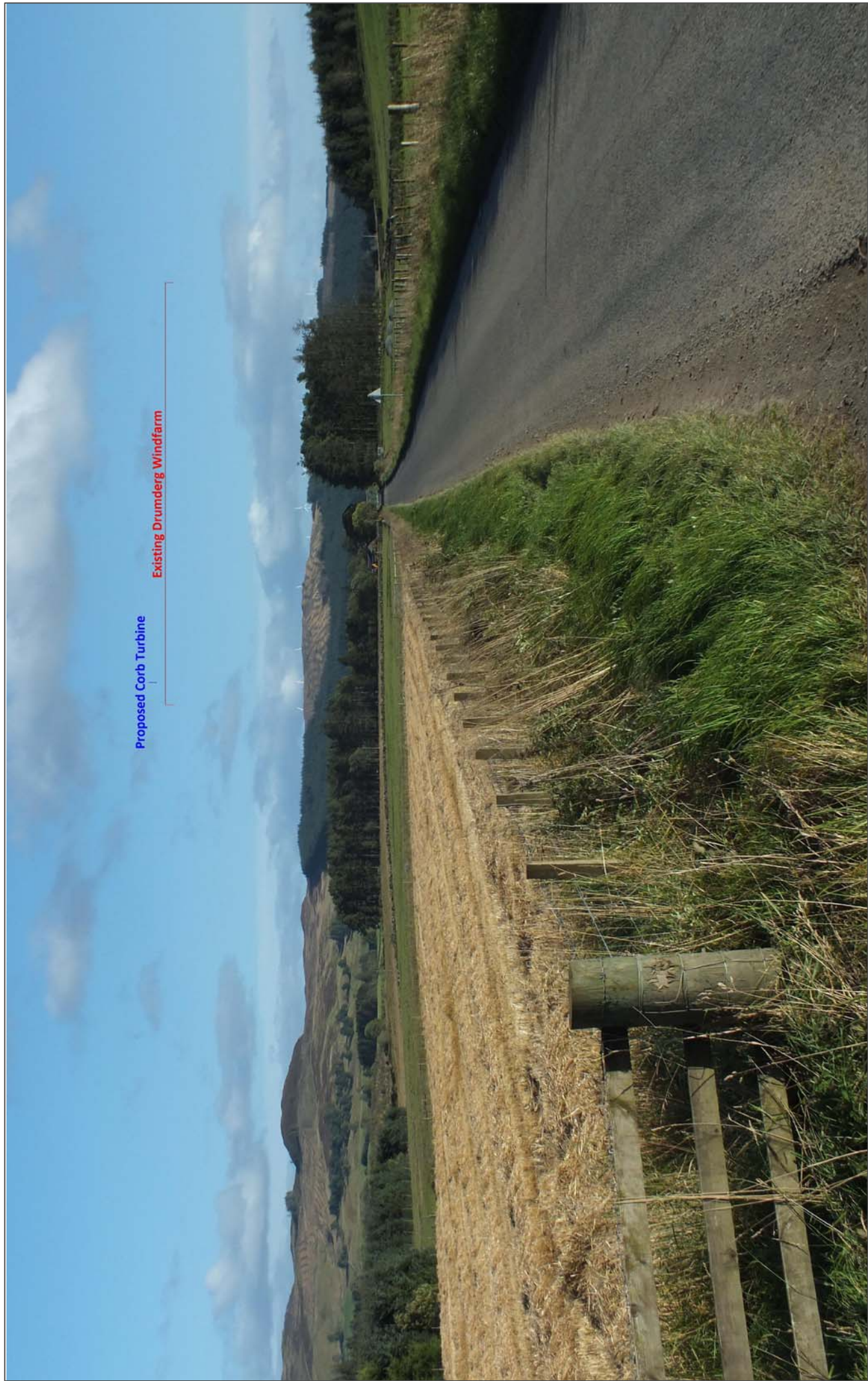
Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 3.65km
Camera: Fujifilm Finepix HS20 EXR
Camera Height: 1.75m
Focal Length: 50mm
Date Photograph Taken: 28/09/2012
Time Photograph Taken: 15:30



Baseline Photograph and Wireframe No. 2 (Figure 4)
The Corb (From B950, Pitlochry Road)

Distance to turbine: 5.40km
Camera: Fujifilm Finepix HS20 EXR
Camera Height: 1.75m
Focal Length: 50mm
Date Photograph Taken: 30/09/12
Time Photograph Taken: 16:15



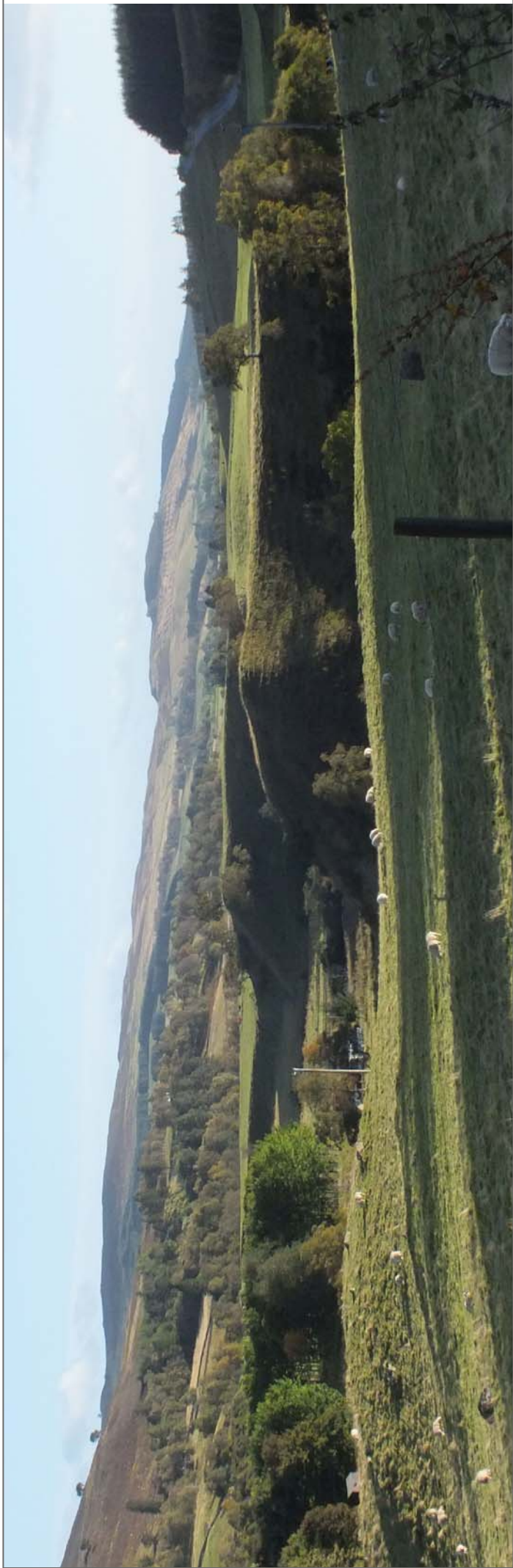
Photomontage No. 2 (Figure 4a)
The Corb (From B950, Pitlochry Road)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 3.65km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 30/09/2012
Time Photograph Taken: 16:15



Proposed Corb Turbine

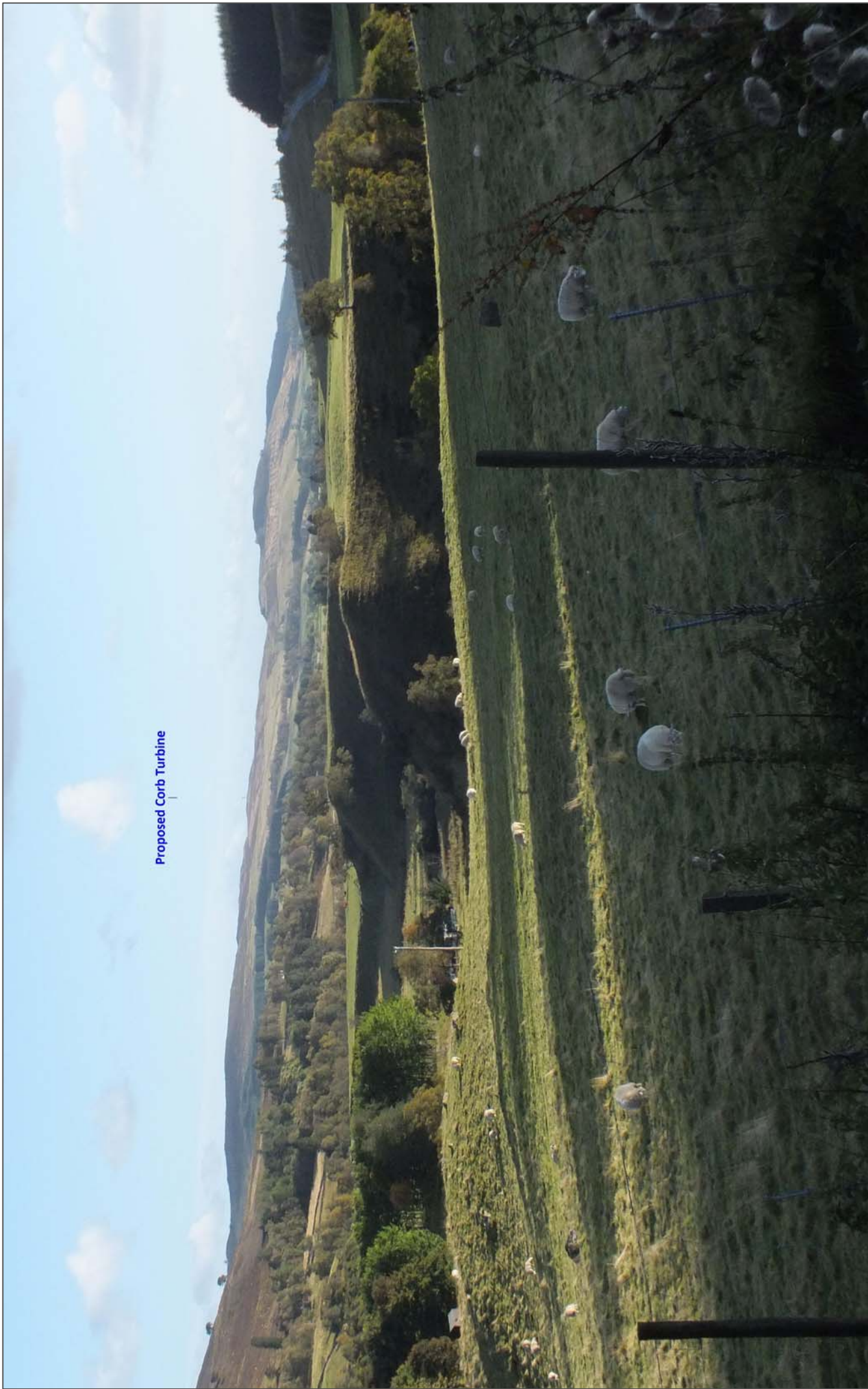
Baseline Photograph and Wireframe No. 3 (Figure 5)
The Corb (From A93, Glenshee Pottery)

Distance to turbine: 6.78km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 30/09/12
Time Photograph Taken: 17:00

Proposed Corb Turbine



Photomontage No. 3 (Figure 5a)
The Corb (From A93, Glenshee Pottery)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 6.78km
Camera: Fujifilm Finepix HS20 EXR

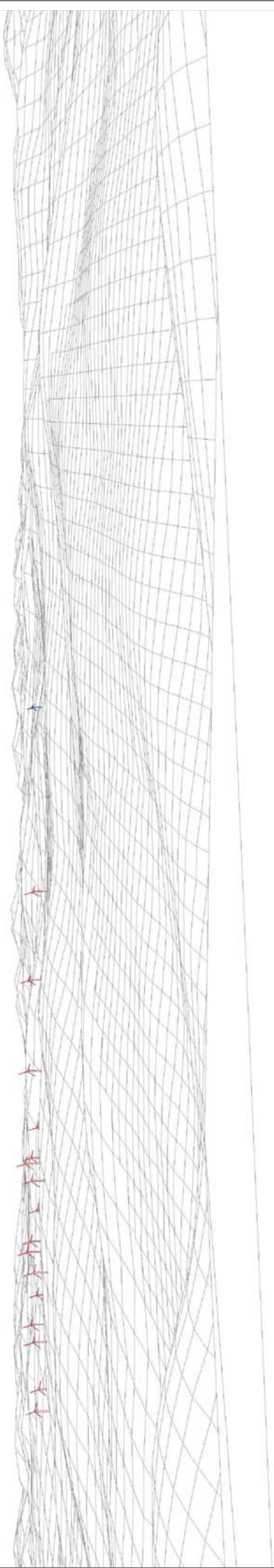
Camera Height 1.75m
Focal Length: 50mm

Date Photograph Taken: 30/09/2012
Time Photograph Taken: 17:00



Proposed Corb Turbine

Existing Drumderg Windfarm

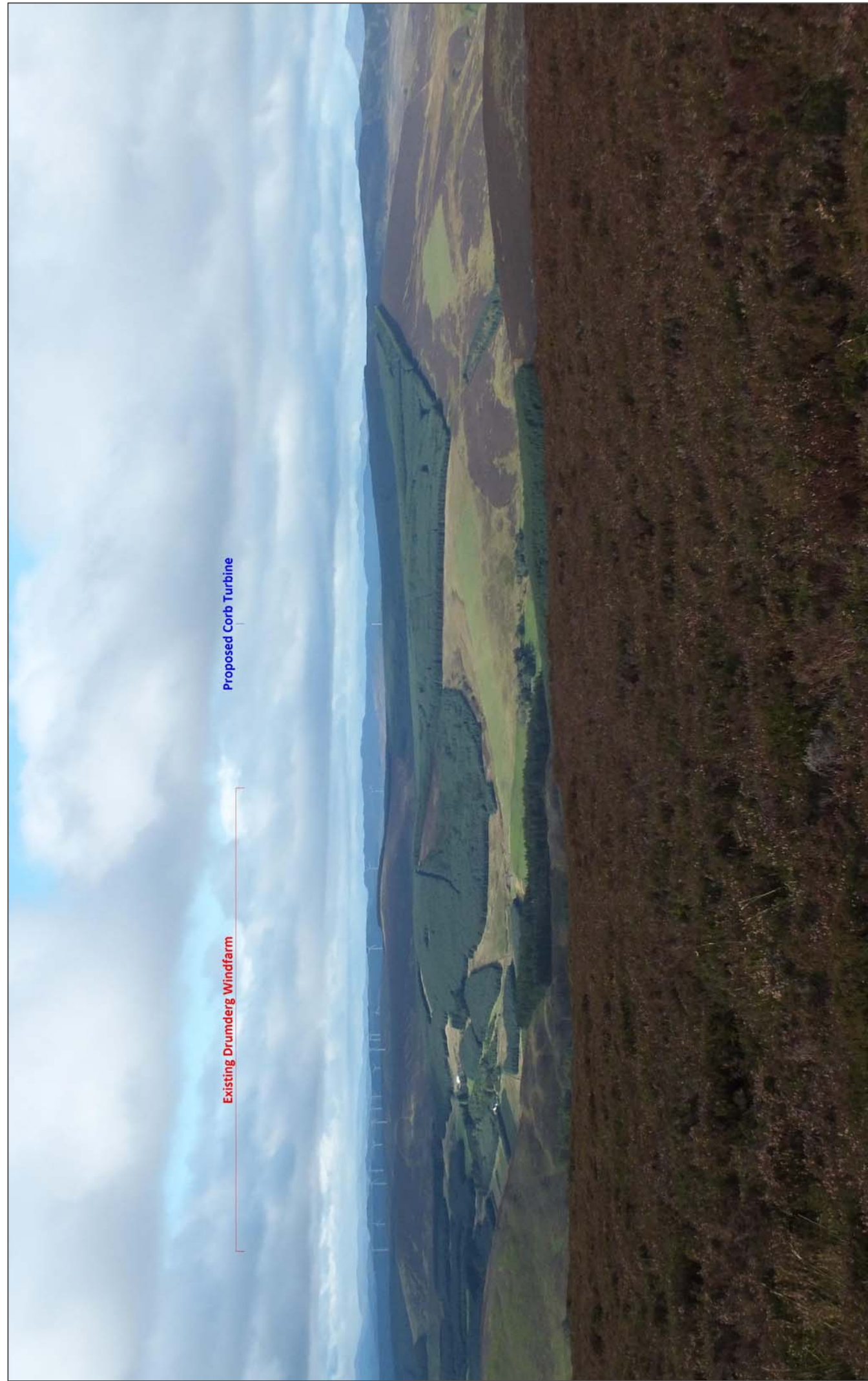


Baseline Photograph and Wireframe No. 4 (Figure 6)
The Corb (From Creigh Hill)

Distance to turbine: 10.10km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 29/09/12
Time Photograph Taken: 11:15



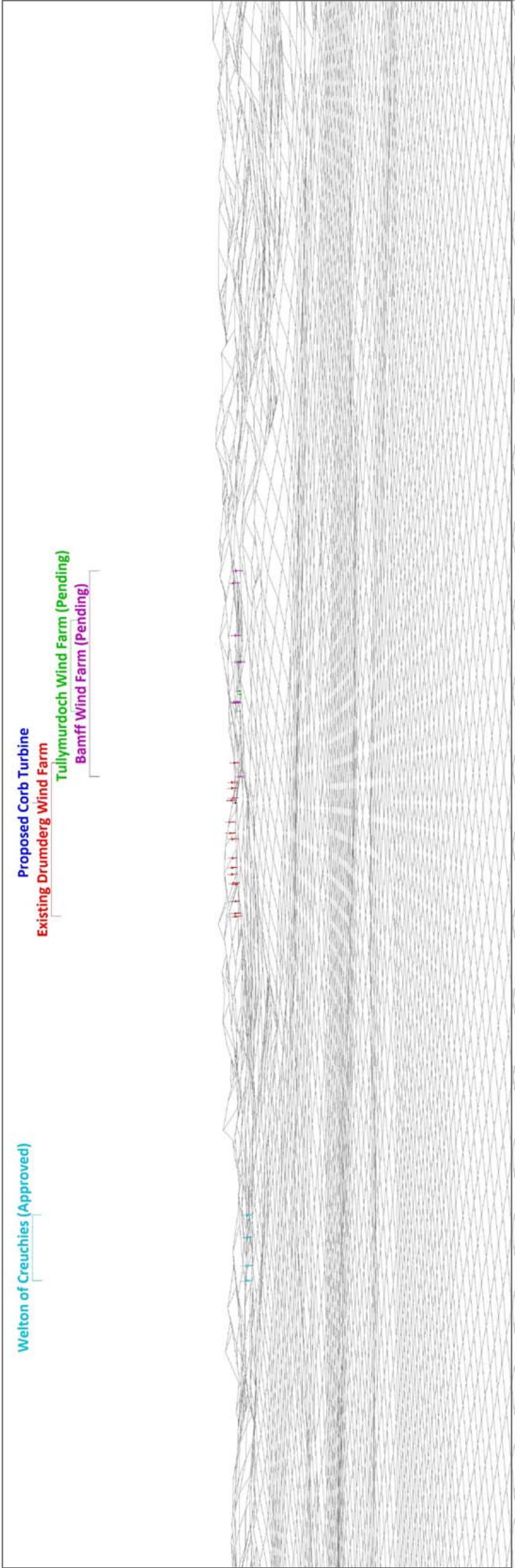
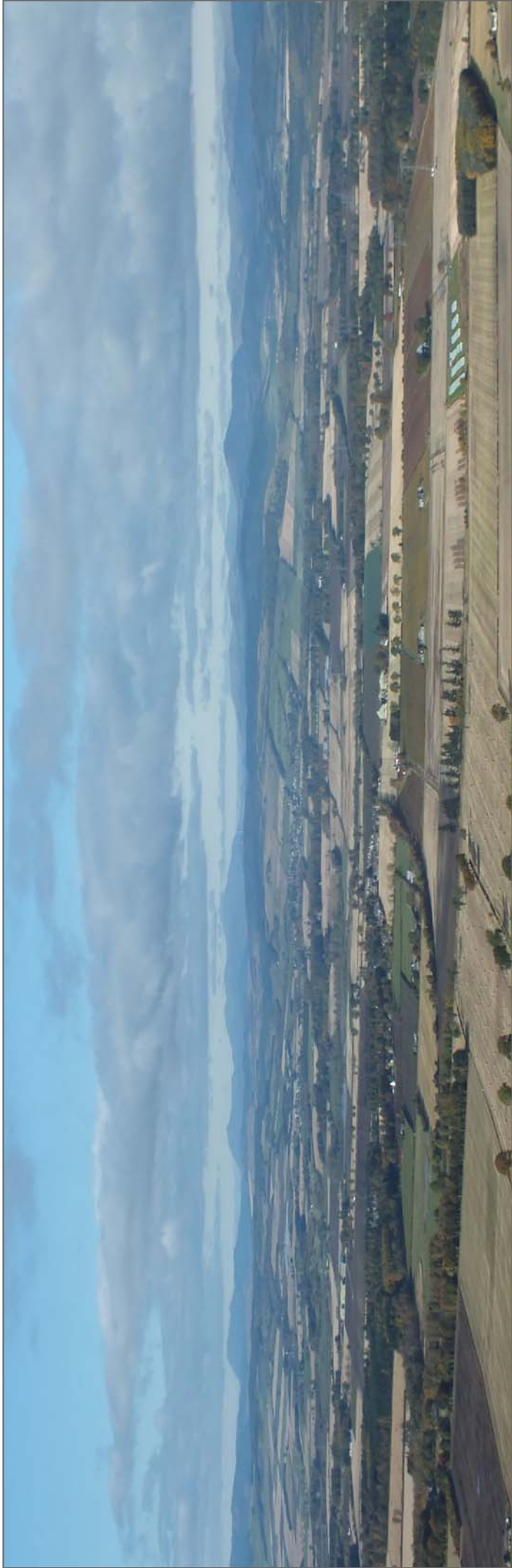
Photomontage No. 4 (Figure 6a)
The Corb (From Creigh Hill)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 10.10km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 29/09/2012
Time Photograph Taken: 11:15



Baseline Photograph and Wireframe No. 5 (Figure 7)
The Corb (From Kinpurney Hill)

Date Photograph Taken: 24/10/12
Time Photograph Taken: 13:20

Camera Height: 1.75m
Focal Length: 50mm

Distance to turbine: 21.89km
Camera: Fujifilm Finepix HS20 EXR



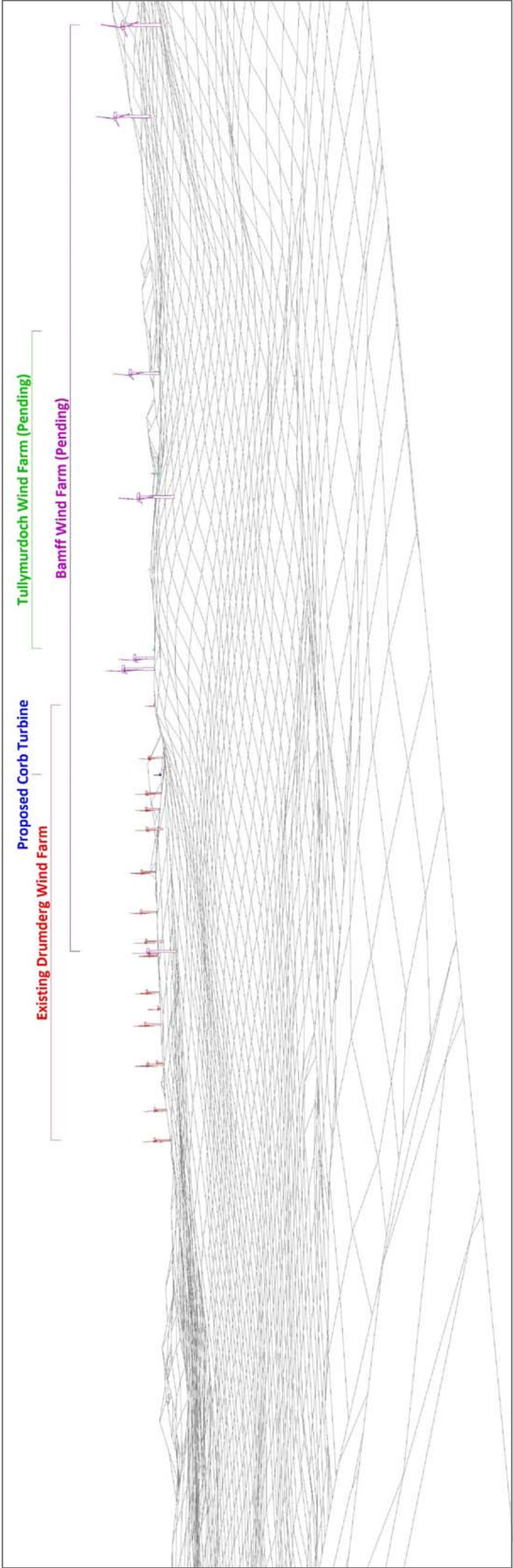
Photomontage No. 5 (Figure 7a)
The Corb (From Kinpurney Hill)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 21.89km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 24/10/2012
Time Photograph Taken: 13:20

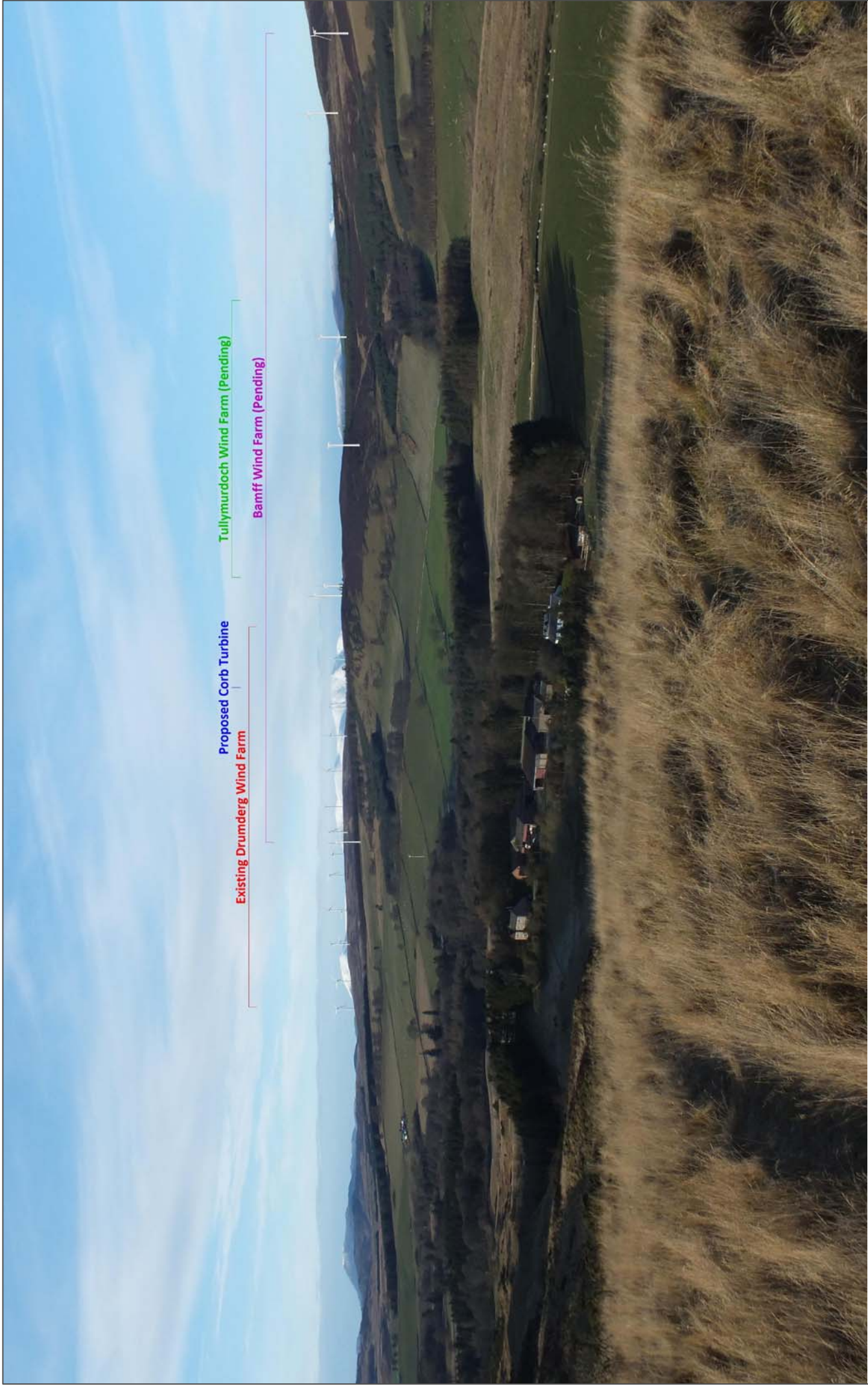


Baseline Photograph and Wireframe No. 6 (Figure 8)
The Corb (From Hill of Alyth)

Distance to turbine: 10.35km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 30/11/12
Time Photograph Taken: 13:10

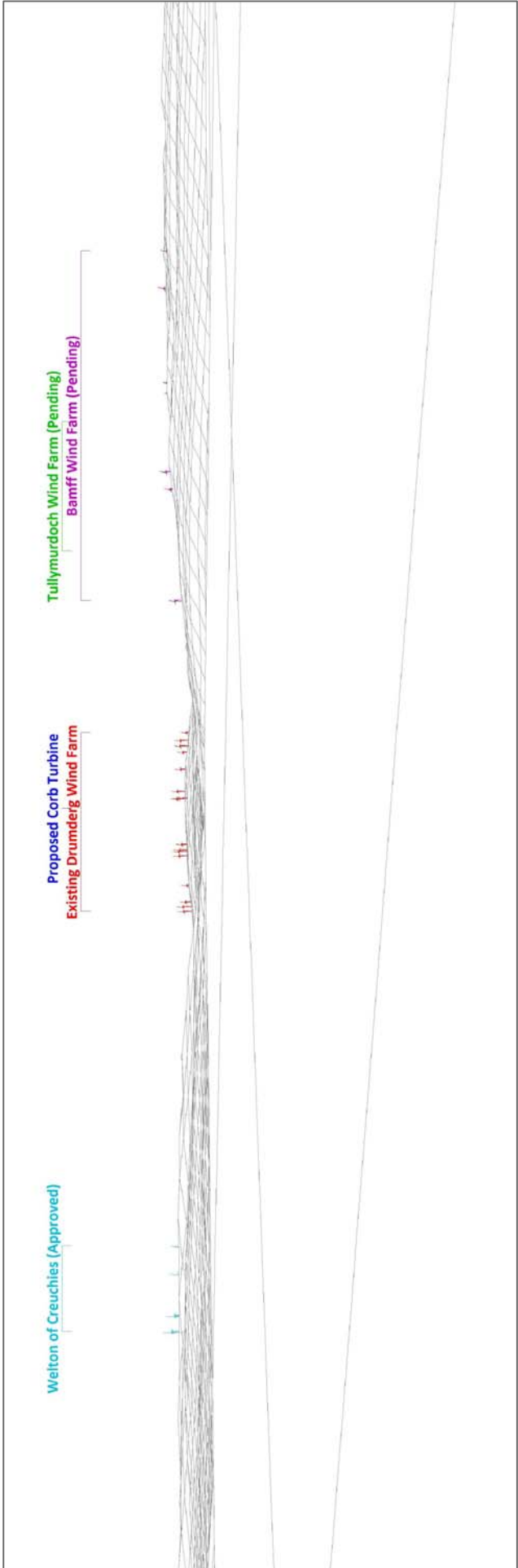


Photomontage No. 6 (Figure 8a)
The Corb (From Hill of Alyth)

Recommended viewing distance when viewed with both eyes: 550mm

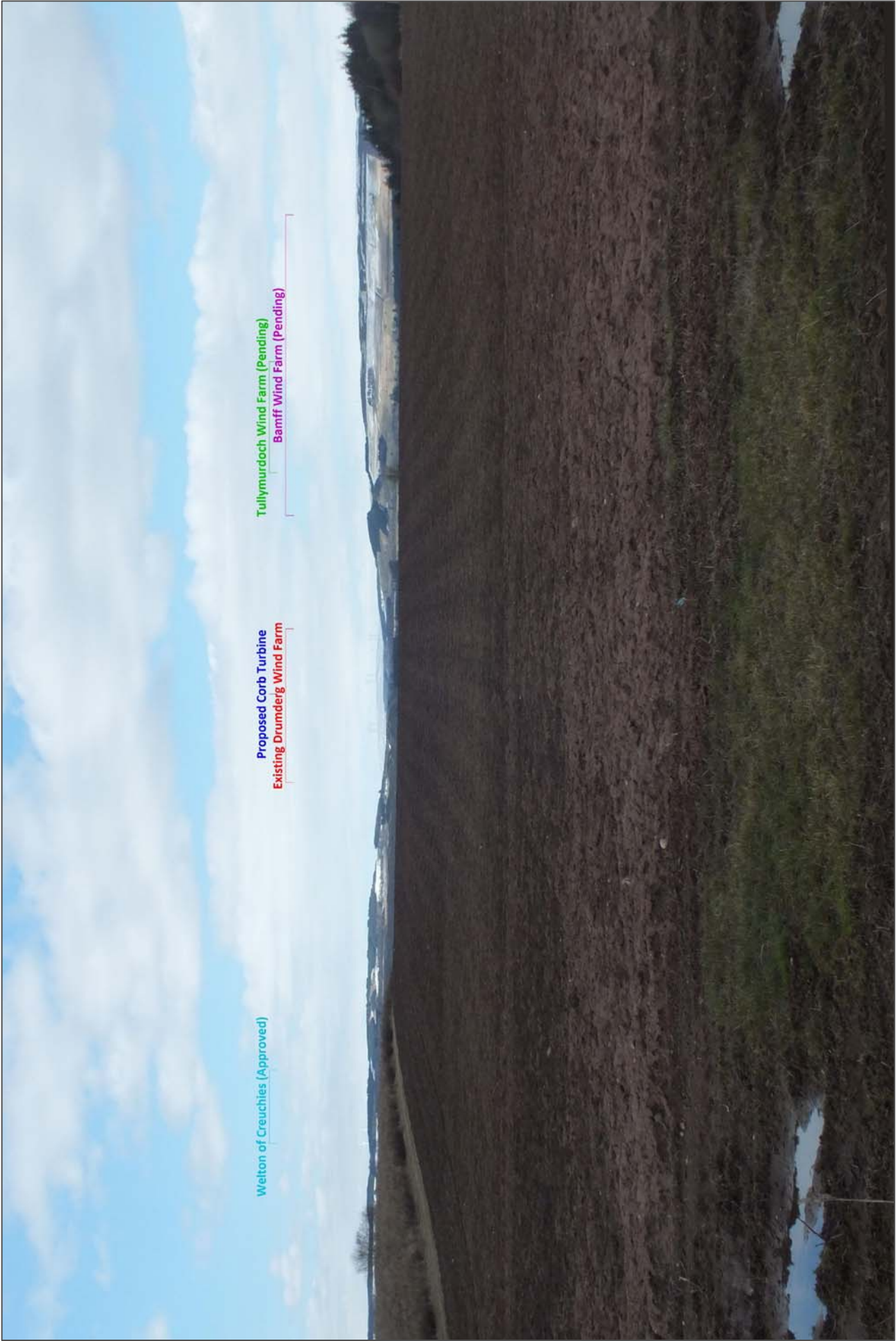
Distance to turbine: 10.35km
Camera: Fujifilm Finepix HS20 EXR
Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 30/11/2012
Time Photograph Taken: 13:10



Baseline Photograph and Wireframe No. 7 (Figure 9)
 The Corb (From A94 at Longley)

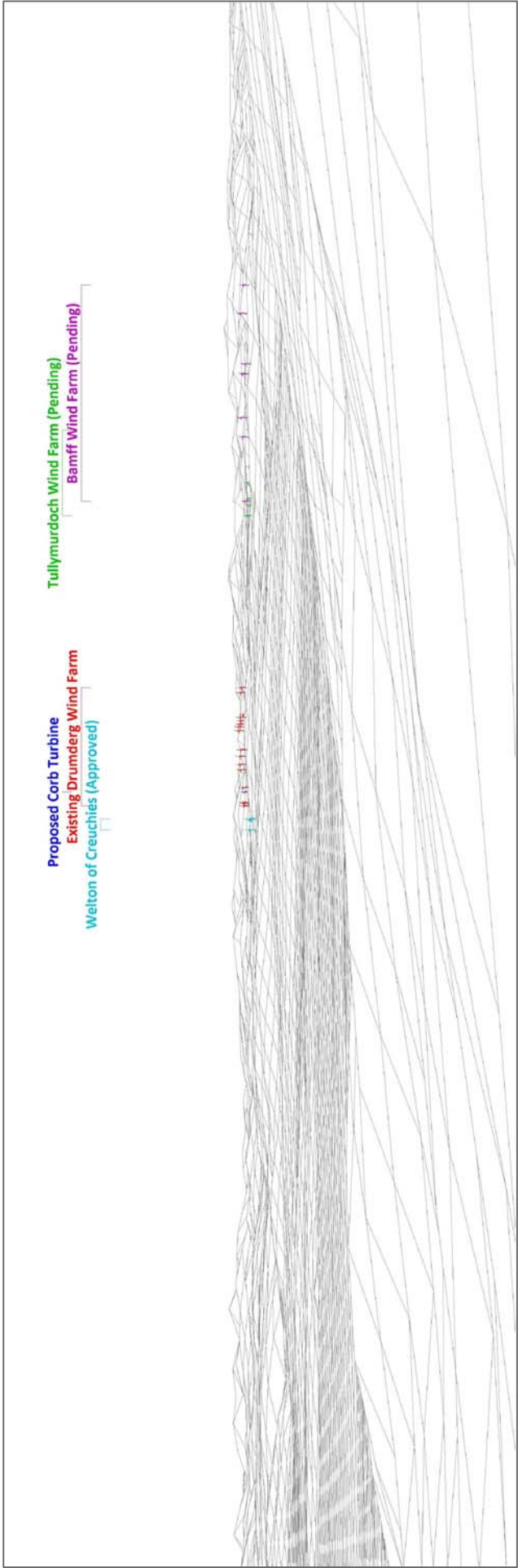
Distance to turbine: 16.78km Camera: Fujifilm Finepix HS20 EXR	Camera Height: 1.75m Focal Length: 50mm	Date Photograph Taken: 02/04/13 Time Photograph Taken: 15:30
---	--	---



Photomontage No. 7 (Figure 9a)
The Corb (From A94 at Longley)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 16.78km
Camera: Fujifilm Finepix HS20 EXR
Camera Height: 1.75m
Focal Length: 50mm
Date Photograph Taken: 02/04/2013
Time Photograph Taken: 15:30



Baseline Photograph and Wireframe No. 8 (Figure 10)
The Corb (From Hallyburton Community Woodland)

Distance to turbine: 23.25km Camera: Fujifilm Finepix HS20 EXR	Camera Height: 1.75m Focal Length: 50mm	Date Photograph Taken: 02/04/13 Time Photograph Taken: 16:00
---	--	---



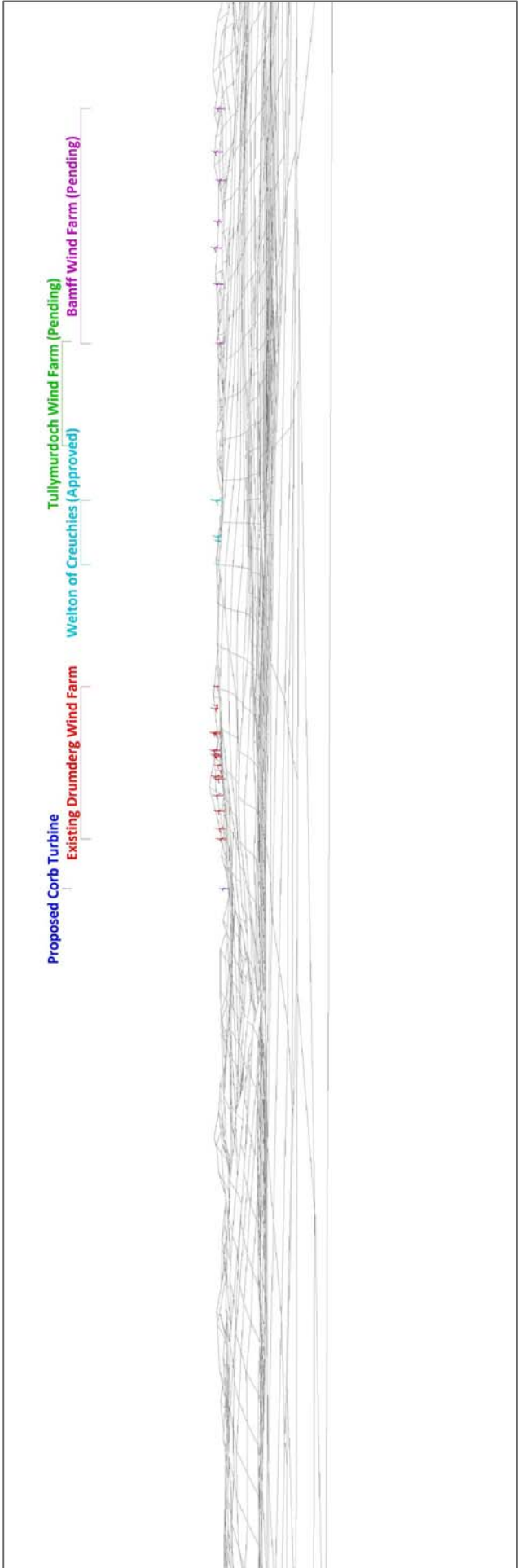
Photomontage No. 8 (Figure 10a)
 The Corb (From Hallyburton Community Woodland)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 23.25km
 Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
 Focal Length: 50mm

Date Photograph Taken: 02/04/2013
 Time Photograph Taken: 16:00



Baseline Photograph and Wireframe No. 9 (Figure 11)
The Corb (From Burrelton - Primary School)

Distance to turbine: 20.26km Camera: Fujifilm Finepix HS20 EXR	Camera Height: 1.75m Focal Length: 50mm	Date Photograph Taken: 02/04/13 Time Photograph Taken: 16:25
---	--	---



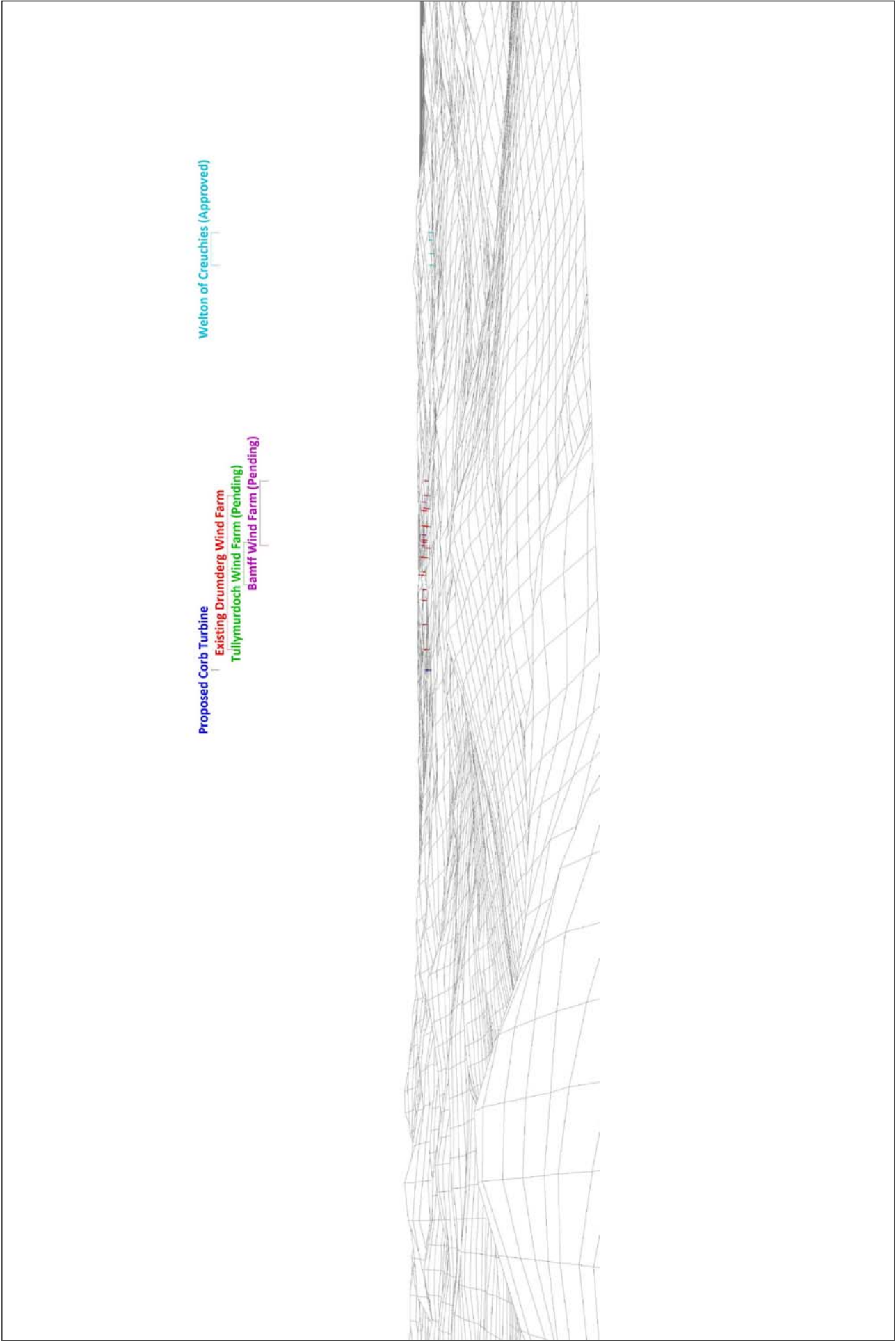
Photomontage No. 9 (Figure 11a)
The Corb (From Burrelton - Primary School)

Recommended viewing distance when viewed with both eyes: 550mm

Distance to turbine: 20.26km
Camera: Fujifilm Finepix HS20 EXR

Camera Height: 1.75m
Focal Length: 50mm

Date Photograph Taken: 02/04/2013
Time Photograph Taken: 16:25



Wireframe No. 10 (Figure 12)
The Corb (From Ben Vrackie, Pitlochry)

Distance to turbine: 21.93km
Camera: N/A

Camera Height: 2.00m
Focal Length: 50mm

Date Photograph Taken: N/A
Time Photograph Taken: N/A

Figure 13: Viewpoint Locator Map 1:25,000
The Corb, Perth and Kinross

Legend:



The Corb Turbine Location
E316389 N757051



A93 Viewpoint Locator



Viewpoint Location Marker

0 0.1750.35 0.7 Kilometres

1:25,000

Ordnance Survey © Crown Copyright 2013.
All rights reserved. Licence number 100020449



Site Name: The Corb

Client: Mr N Bailey

Site Reference: WV1020

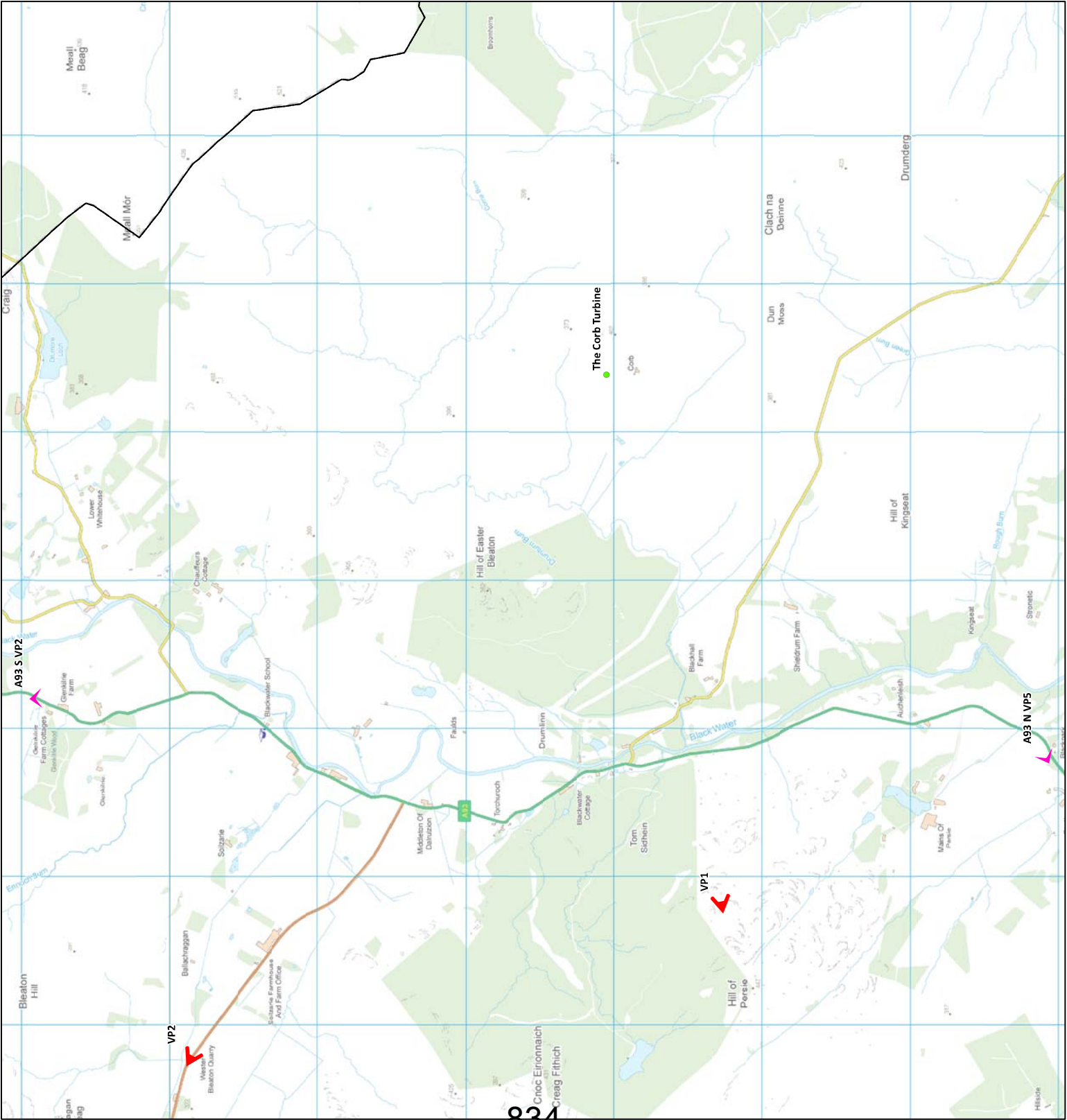
Drawing No: 011a

Date: 10/04/2013

Drawn by: chris.lockett



Waterside Farm
Glasgow Road
Glasgow K44 8PB
t: 01563 829999
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk



**Figure 14: Viewpoint Locator Map 1:200,000
The Corb, Perth and Kinross**

Legend:



The Corb Turbine Location
E316389 N757051



A93 Viewpoint Locator



A94 Viewpoint Locator



Viewpoint Location Marker

0 1.5 3 6 Kilometres

1:200,000

Ordnance Survey © Crown Copyright 2013.
All rights reserved. Licence number 100020449

Site Name: The Corb

Client: Mr N Bailey

Site Reference: WV1020

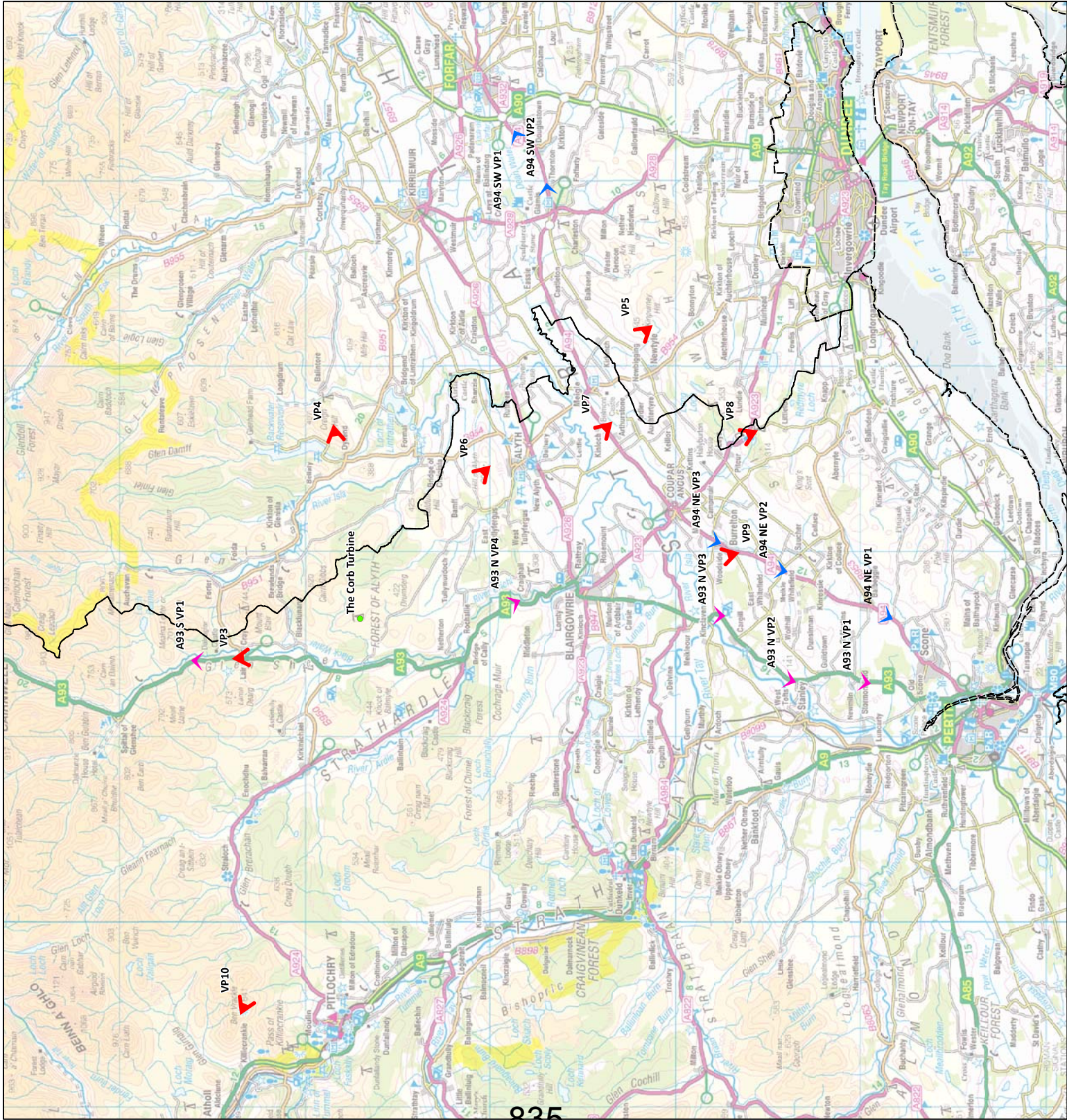
Drawing No: 012a

Date: 10/04/2013

Drawn by: chris.lockett



Waterside Farm
Glasgow Road
Glasgow K44 8PB
t: 01563 829999
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk



TCP/11/16(256)

Planning Application 12/01934/FLL – Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally, Blairgowrie, PH10 7JX

PLANNING DECISION NOTICE

REPORT OF HANDLING

REFERENCE DOCUMENTS

PERTH AND KINROSS COUNCIL

Mr Norman Bailey
c/o VG Energy
Waterside Farm
Glasgow Road
Galston
KA4 8PD

Pullar House
35 Kinnoull Street
PERTH
PH1 5GD

Date 7th May 2013

TOWN AND COUNTRY PLANNING (SCOTLAND) ACT

Application Number: **12/01934/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 7th November 2012 for permission for **Erection of a wind turbine, meter house and associated access track The Corb Bridge Of Cally Blairgowrie PH10 7JX** for the reasons undernoted.

Development Quality Manager

Reasons for Refusal

1. The proposed siting of the turbine, remote from the existing turbine grouping at Drumderg Wind Farm, extends wind development along the Highland Boundary Fault to the detriment of visual amenity and landscape character. The proposal will also have a detrimental cumulative impact on landscape character. The Council is not satisfied that the energy contribution of the proposed turbine would outweigh the adverse effects on local environmental quality. Accordingly, the proposal is contrary to National Scottish Planning Policy (SPP), Policy 6 of the approved TAYplan 2012; and Policies 2, 9, 38 of the Eastern Area Local Plan 1998 and Policies PM1A, ER1A and ER6 of the Proposed Local Development Plan.

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

12/01934/1

12/01934/2

12/01934/3

12/01934/4

12/01934/5

12/01934/6

REPORT OF HANDLING

DELEGATED REPORT

Ref No	12/01934/FLL
Ward No	N3- Blairgowrie And Glens

PROPOSAL: Erection of a wind turbine, meter house and associated access track

LOCATION: The Corb Bridge Of Cally Blairgowrie PH10 7JX

APPLICANT: Mr Norman Bailey

RECOMMENDATION: REFUSE THE APPLICATION

SITE INSPECTION: 14 March 2013

OFFICERS REPORT:

Full planning consent is sought for the erection of a wind turbine (55m to hub and 84m to tip), meter house and associated access track at The Corb, Bridge of Cally which sits to the north of the Drumderg Windfarm. This application is a re-submission with a revised turbine size of a previously withdrawn application (12/01568/FLL). The application sites is located on the a westerly facing slope to the north east of Bridge of Cally and the north west of the Drumderg windfarm. The proposed turbine is approximately 220m from neighbouring buildings. The land rises to the east of the turbine to the top of the hill which sits at 397m OD. A Zone of Theoretical Visibility accompanies the application, together with visualisations, demonstrating both visual impact and cumulative visual impact of the turbine.

Due to the development falling within schedule 2 of the Environmental Impact Assessment (Scotland) Regulations 2011 under Part 3 Energy Industry column 1 (i) column 2 (ii) the Planning Authority took account of the criteria contained within the EIA Regulations and adopted a screening opinion that an EIA was not required on this specific site. 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.

Sections 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 as amended by Planning Etc (Scotland) Act 2006 require that planning decisions be made in accordance with the development plan unless material considerations indicate otherwise. The determining issues in this case are whether: - the proposal complies with development plan policy; or if there are any other material considerations which justify a departure from policy.

The determining issues in this case are: - whether the siting and scale of the turbine complies with the development plan and national policy, whether the proposal would result in an unacceptable cumulative impact on the existing landscape character and visual amenity of the area and whether approval/refusal is justified by other material considerations.

Policy 6 of the TAYplan relates to the aim of delivering a low/zero carbon future for the city region to contribute to meeting Scottish Government energy targets and indicates that, in determining proposals for energy development, consideration should be given to the effect on off-site properties, the sensitivity of landscapes and cumulative impacts. Policy 9 sets out the main criterion that requires to be taken into account in the assessment of renewable energy developments under the Eastern Area Local Plan 1998 (EALP). Policy ER1A (a material consideration) sets out the Councils updated position which is contained within the Proposed Local Development Plan 2012 (PLDP).

Although the policy position is generally supportive of renewable energy schemes this is subject to a number of criteria being satisfied. While renewable energy schemes may meet some environmental requirements and not others an overall judgement has to be made on the weight to be given to the 'positives' and 'negatives' which will determine whether it is environmentally acceptable. Any significant adverse effects on local environmental quality must be outweighed by the proposals energy contribution.

Environmental and Economic Benefits

The submitted statement indicates that that turbine will generate 850kw and will be connected to the national grid. It would therefore make some contribution towards the Scottish Governments target of 100% electricity generation from renewable energy resources by 2020 as well as a reduction in fossil fuels that would assist the aim of TAYplan Policy 6 which seeks to deliver a low/zero carbon future for the Region.

The general economic benefits associated with the wind turbine are detailed in the applicant's submission. The agents assessment concludes that the construction of the development will result in short term, minor positive effects through the increase in employment and business opportunities.

Landscape and Visual Impacts

Policy 9 of the Eastern Area Local Plan 1998 (EALP) is one of the key development plan policies in the determination of this renewable energy application. Criterion contained within the policy seeks to safeguard the intrinsic landscape quality of the area and prevent loss of amenity to neighbouring properties. There is a further requirement through policy 02 and 38 of the EALP as well as policy ER6 of the Proposed Local Development Plan (PLDP) to take account of the landscape.

The proposed site located within the Highland Summits and Plateaux landscape character type as described in the SNH Tayside Landscape Character Assessment (TLCA) 1999. Although not a statutorily protected landscape in terms of national, regional or local designations it is necessary to take account of the sites relationship to the Highland Boundary Fault (HBF) which forms a dramatic interface between the highland and lowlands which is an important landscape feature.

The applicant's submission includes a Landscape and Visual Impact Assessment and additional viewpoints and cumulative viewpoints were submitted following various meetings between the agent, planning officer and Council's Landscape advisor.

There is a tip height difference of 23m between the Corb and Drumderg but the applicant argues that the ground elevation between the turbines at Drumderg varies between 367m and 419m (AOD) and therefore provides a visual variance in tip height of up to 52m. It is therefore considered by the applicant that the turbine height difference is insignificant. Furthermore the rotation speed of the proposed turbine will differ from Drumderg, however the applicant states that rotational speeds at Drumderg already vary so the additional turbine and differing speed will not be significant. I am satisfied that the differing height of the turbine and varied rotational speed will not have a significant impact on visual amenity or landscape character. The position of the turbine in relation to the Drumderg Windfarm does, however, raise concerns.

The applicant has submitted a total of 9 viewpoints and has concluded that overall the proposed turbine can be absorbed into the landscape and viewed as an acceptable part of Drumderg Windfarm.

Photomontage 1: Knock of Balmyle Hill

From this viewpoint the proposed turbine will be seen sitting adjacent to the Drumderg cluster and the applicant argues that it will be seen as part of the linear array to the north of Drumderg (turbines 12, 13 and 14) which extend towards the Corb from the compact grid formation of the remainder of the cluster. The applicant argues that the additional turbine is not out of scale or at odds with this formation. In my view the proposed turbine appears visually separate from Drumderg Wind Farm. The gap between the Corb turbine and the remainder of the linear array at Drumderg is almost double the size of the gap between the existing turbines within the linear array. This, in my view, draws the eye away from the main cluster and increases the impact of the wind farm over a wider part of the landscape. The applicant was advised to relocate the turbine further south/east to the far edge of their land ownership area to ensure this gap was reduced but has chosen not to do this. The applicant has stated that the significance of effect on visual amenity to be "moderate/minor". Given the gap between the proposed turbine and Drumderg I consider the impact to be more significant. The key aspect is the sensitivity of this viewpoint. The applicant concludes that this is "medium" as the receptors will mainly be hillwalkers within the foothills and greater highlands area (not clear designated trails). I agree with the applicant's assessment that the visual sensitivity of this viewpoint is not particularly high but I still consider the position of the turbine to have a detrimental impact on visual amenity from this viewpoint, particularly where it could be moved further south to better relate to the existing windfarm.

Photomontage 2: B950 Pitlochry Road

The turbine is considered to read as part of Drumderg from this viewpoint and I share the applicant's conclusion that impact on this view is negligible.

Photomontage 3: A93 Glenshee Pottery - facing south

Views are screened by topography and landform along A93 when driving south. Whilst there may be a small glimpse of the turbine the impact from this viewpoint is not considered to be significant.

Photomontage 4: Creigh Hill/Blackwater Reservoir

This viewpoint is from the east and the same concerns as outlined in photomontage 1 exist here in that the turbine is seen to be remote from the main cluster at

Drumderg. Again the sensitivity of this location is not particularly high as it is restricted to walkers within the foothills and great highlands area.

Photomontage 5: Kinpurney Hill

No concerns as turbine seen as part of Drumderg.

Photomontage 6: Hill of Alyth

No concerns as turbine seen as part of Drumderg.

Photomontage 7: A94 at Longley

No concerns as turbine seen as part of Drumderg.

Photomontage 8: Hallyburton Community Woodland

No concerns as turbine seen as part of Drumderg.

Photomontage 9: Burrleton

From this viewpoint the turbine, similar to photomontage 1 and 4, is remote from the main grouping at Drumderg and the spacing between the most northern turbine of Drumderg and the proposed turbine does not relate to the existing spacing. The existing Drumderg windfarm from this viewpoint, whilst visible, is relatively nucleated as a grouping. The Welton of Creuchies approved development extends wind farm development to the east along the Highland Boundary Fault. The proposed turbine extends the footprint of wind development on the Highland Boundary Fault to the west creating visual clutter when viewed from this important viewpoint to the south. Furthermore the sensitivity of this viewpoint is high as the receptors will mainly be residents. I do not agree with the applicant's assertion that the impact will be negligible. Similar to my comments above, if the turbine was moved further south/east this would help to give it a better relationship with the existing grouping and ensure it does not extend the wind development so significantly along the fault line.

Overall I consider the proposed turbine would compromise the existing composition of Drumderg, extend wind development to the west along the Highland Boundary Fault to the detriment of visual amenity and landscape character.

Roadway Study

The submission also includes a roadway study to demonstrate the impact of the proposed turbine as an individual travels through the area. The impact from the majority of roads in the area is considered negligible, however there are considered to be more substantial impacts from the A94. Travelling along the A94 from Perth to Forfar wind farm is evident within the upper landscape types which skirt the Strathmore valley in which the A94 sits. The submission states that The Corn turbine will be visible from a 1.5km section north of Perth Airport heading north east to Balbeggie; a 7.8km section, 1km north of Balbeggie to the northern edge of Burrleton and again for a 5.3km section from the A90 junction at Forfar towards Glamis. This represents a potential impact to 33.5% of the overall distance between Perth and Forfar. Wireframes have been submitted to demonstrate views from three locations on the A94 to the south of Coupar Angus. These all demonstrate that the Corb

turbine will be seen remote from the main grouping at Drumderg and therefore similar concerns as those identified under photomontage 1, 4 and 9 above exist for these road users. It is noted, however, that tree cover, hedges, walls etc which skirt the roadway corridor will break views towards the turbine.

Impact on Natural Heritage

Local Plan Policies 1 and 17 seek to protect and conserve wildlife, habitat and other natural features. I have used the Council's Sustainable Mapping System to ascertain whether protected species are in close proximity to the site. In this case records of:

- Whorled Solomon's Seal
- Bluebell
- Natterer's Bat
- Brown Long-eared Bat
- Short-eared Owl

The turbine is located in such a way that bats are not likely to be affected, and while Short-eared Owl is confirmed as nesting in the vicinity a single turbine will have a low impact on this species. The two plant species are found in woodland and so will not be affected by the development.

It is considered that scale of this scheme and the lack of any objection from statutory consultees will ensure the impact on protected species is minimal. Based on my assessment I am satisfied that I would not be precluded from granting planning permission for this development in terms of the Habitat Regulations given the small scale nature of the development.

Noise

Planning Advice Note 56 'Planning and Noise' specifies the planning system has an important role to play in preventing and limiting noise pollution and that noise implications of development can be a material consideration in determining applications for planning permission. The Council's Environmental Health Department has been consulted on the application and offers no objection. It is highlighted that noise from the turbine is not anticipated to adversely affect neighbouring noise sensitive premises however conditions to control potential noise should be incorporated into any approval.

Cultural Heritage

Eastern Area Local Plan 1998 Policies 23 and 47 seek to protect cultural heritage resources of the area. I have taken account of the Craighall Rattray Historic Gardens and Designed Landscape and the surrounding Listed Buildings and consider that the proposed development will not adversely affect these designations. Taking this into account I conclude that the development would not conflict with local plan policy 23 and 47. No archaeological mitigation is required for this proposal as confirmed by Perth and Kinross Heritage Trust.

Private Water Supplies

Consultation with Environmental Health confirms that the development is in an area known to be part of a catchment for private water supplies. The principal risk to water supplies is during the construction. While contamination of water supplies is a private legal issue, I consider it only reasonable to ensure the safeguarding of water quality and water supplies thereby ensuring the amenity of residential and commercial premises are protected. Consequently an informative could attach to the consent if approved to secure this matter.

Defence Infrastructure

The Ministry of Defence have offered no objection.

Access

The existing access track to the Corb will be used for the site with a small section of new track proposed to the north of the farm to the turbine site. Transport Planning have no objections to the proposal.

Decommission and reinstatement

At the end of the wind turbines operational life (anticipated 25 years), the process of decommission and site reinstatement will commence which will primarily include the removal of infrastructure. This matter can be controlled by condition to ensure that this process is carried out in an acceptable manner.

Conclusion

In conclusion, the application must be determined in accordance with the adopted Development Plan unless material considerations indicate otherwise. In this respect, the proposal does not comply with the adopted Eastern Area Local Plan, in regard to impact on landscape character, visual amenity and cumulative visual impact. As indicated elsewhere in this report, I believe moving the turbine further south/east, closer to Drumderg could potentially address the concerns I have with this proposal as the turbine would then be seen as an addition to the windfarm. The applicant may wish to consider this option further. I have taken account of material considerations and find none that would justify overriding the adopted Development Plan. On that basis the application is recommend for refusal.

The Scottish Planning Policy 2010

The 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.

The following sections of the SPP are of particular importance in the assessment of this application:-

- Paragraph 25: Determining planning applications
- Paragraph 33: Sustainable Economic Growth
- Paragraphs 34 – 44: Sustainable Development and Climate Change
- Paragraphs 110 – 124: Historic Environment
- Paragraphs 125 – 148: Landscape and Natural Heritage
- Paragraphs 165 – 176: Transport
- Paragraphs 196 – 211: Flooding and Drainage
- Paragraphs 183 – 191: Renewable Energy & Wind Farms and sets out National planning policy.
- Paragraph 255: Outcomes

The following Scottish Government Planning Advice Notes (PAN) are also of interest:

- PAN 1/2011 Planning and Noise
- PAN 2/2011 Planning and Archaeology
- PAN 40 Development Management
- PAN 45 Renewable Energy
- PAN 51 Planning, Environmental Protection and Regulation
- PAN 60 Planning for Natural Heritage
- PAN 75 Planning for Transport
- PAN 79 Water and Drainage

2020 Routemap for Renewable Energy in Scotland - 2011

Sets out Scottish Government's ambitions for renewable energy and highlights a strategy for the delivery of a target to meet an equivalent of 100% demand for electricity from renewable energy by 2020. As well as providing broad support for renewable energy development the strategy is underpinned by the principle of demand reduction.

S3.2 sets out key actions in respect of Onshore Wind development. In relation to the role of Planning it is advised that:

The planning system must continue to balance environmental sensitivities with the need to make progress on renewable targets, and support planning authorities in maximising opportunities. Planning Authorities should also be encouraged to complete the spatial frameworks required by Scottish Planning Policy, deliver development plans which clearly set out the spatial and policy context for renewables and implement development management procedures that allow for appropriately designed and sited onshore wind proposals to emerge.

Onshore wind turbines – 2012

Provides specific topic guidance to Planning Authorities from Scottish Government.

The topic guidance includes encouragement to planning authorities to:

- development spatial strategies for wind farms;
- ensure that Development Plan Policy provide clear guidance for design, location, impacts on scale and character of landscape; and the assessment of cumulative effects.
- the involvement of key consultees including SNH in the application determination process;
- direct the decision maker to published best practice guidance from SNH in relation to visual assessment, siting and design and cumulative impacts.

In relation to any assessment of cumulative impacts it is advised that:

In areas approaching their carrying capacity the assessment of cumulative effects is likely to become more pertinent in considering new wind turbines, either as stand alone groups or extensions to existing wind farms. In other cases, where proposals are being considered in more remote places, the threshold of cumulative impacts is likely to be lower, although there may be other planning considerations.

In assessing cumulative landscape and visual impacts, the scale and pattern of the turbines plus the tracks, power lines and ancillary development will be relevant considerations. It will also be necessary to consider the significance of the landscape and the views, proximity and inter-visibility and the sensitivity of visual receptors.

DEVELOPMENT PLAN

The Development Plan for the area consists of the Tayplan Strategic Development Plan 2012 – 2032 Approved June 2012 and the Adopted Eastern Area Local Plan 1998.

Tayplan Strategic Development Plan 2012

The vision set out in the TAYplan states that:

“By 2032 the TAYplan region will be sustainable, more attractive, competitive and vibrant without creating an unacceptable burden on our planet. The quality of life will make it a place of first choice, where more people choose to live, work and visit and where businesses choose to invest and create jobs.”

The principal relevant policies are in summary:-

Policy 2: Shaping Better Quality Places

Seeks to ensure that climate change resilience is built into the natural and built environment, integrate new development with existing community infrastructure, ensure the integration of transport and land uses, ensure that waste management solutions are incorporated into development and ensure that high resource efficiency and low/zero carbon energy generation technologies are incorporated with development to reduce carbon emissions and energy consumption.

Policy 3: Managing TAYplan's Assets

Seeks to identify and safeguard at least 5 years supply of employment land within principle settlements to support the growth of the economy and a diverse range of industrial requirements.

Policy 6: Energy and Waste/Resource Management Infrastructure

Provides broad support to renewable energy development where locational considerations and impacts can be satisfactorily addressed. Sensitivity of landscape and the cumulative effects of development are included as key considerations which will be used to influence locational policies in new Local Development Plans.

Eastern Area Local Plan 1998

The Plan identifies the protection and enhancement of the environment as a key Council Strategic Policy.

The principal relevant policies are in summary:

Policy 01: Sustainable Development

The Council will seek to ensure, where possible, that development within the Plan area is carried out in a sustainable manner. Where development is considered to be unsustainable but has other benefits to the area which outweigh the sustainability 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 the sustainability of projects:-

- a) Non-renewable resources should be used wisely and sparingly, at a rate which does not restrict the options of future generations.
- b) Renewable resources should be used within the limits of their capacity for regeneration.
- c) The quality of the environment as a whole should be maintained and improved.
- d) In situations of great complexity or uncertainty the precautionary principle should apply.
- e) There should be an equitable distribution of the costs and benefits (material and non-material) of any development.

Policy 02: General Development Policy

All developments within the Plan area not identified as a specific policy, proposal or opportunity will also be judged against a series of criteria, including, a landscape framework, the scale, form, colour and density, of existing developments within the locality, compatible with its surroundings in land use terms and they should not result in significant environmental damage or loss to the amenity or character of the area, the road network should be capable of coping with traffic generated by the development and satisfactory access on to that network provided, sufficient spare capacity in drainage and water services

to cater for new development, the site should be large enough to accommodate the development satisfactorily in site planning terms and buildings and layouts for new development should be designed so as to be energy efficient.

Policy 03: Flood Risk

Development in areas liable to flood, or where remedial measures would adversely affect flood risk elsewhere, will not normally be permitted.

For the purposes of this policy flood risk sites will be those which are judged to lie within:-

- (1) Areas which flooded in January 1993.
- (2) Sites which lie within a flood plain.
- (3) Low lying sites adjacent to rivers, or to watercourses which lead to categories 1 and 2.

Policy 09: Renewable Energy

The Council will encourage, in appropriate locations, developments which contribute towards the Scottish Renewables Obligation. In the absence of a detailed Council wide policy on renewable energy production, developments will be assessed against the following criteria:

1. That provision can be made for construction traffic, without danger to road traffic safety or the environment.
2. That the development will not have a significant detrimental effect on sites of nature conservation interest or sites of archaeological interest.
3. That the development will not result in an unacceptable intrusion on the intrinsic landscape quality of the area.
4. That the development will not result in a loss of amenity to neighbouring occupiers by reasons of noise emission, visual dominance, electromagnetic disturbance or reflected light.
5. The cumulative impact of having two or more windfarms in the same area will be considered.

The proposed transmission lines between development and the National Grid will be considered an integral part of the development and their impact will also be assessed in relation to the above criteria. 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 12: Environment and Conservation

In the absence of imperative reasons of overriding public interest, the Council will not grant consent for, or support, development which would damage the integrity of Sites of Special Scientific Interest, National Nature Reserves, Special Protection Areas, Ramsar Sites and Special Areas of Conservation.

Policy 14: Environment and Conservation

The Council will not normally grant consent for any development which would have an adverse effect on:- sites supporting species mentioned in Schedules 1, 5 and 8 of the Wildlife and Countryside Act, 1981 as amended; Annex II or IV of the European Community Habitat and Species Directive; Articles 1.4 and 1.2 of the European Community Wild Birds Directive.

Policy 15: Environment and Conservation

The Council will not normally grant consent for any development which would have an adverse effect upon those habitats and species listed in Annex I and II of the EC Habitats and Species Directive.

Policy 17: Environment and Conservation

The Council recognises the community and educational benefits associated with nature conservation and will therefore seek to realise opportunities for habitat creation, retention and sympathetic management in:-

1. Land reclamation and environmental improvement schemes.
2. Public open spaces.
3. Other land held by this Authority.

Policy 20: Archaeology

The Council will safeguard the settings and archaeological landscapes associated with Scheduled Ancient Monuments (protected under the Ancient Monuments and Archaeological Areas Act 1979), unless there are exceptional circumstances.

Policy 21: Archaeology

The Council will seek to protect unscheduled sites of archaeological significance. Where development is proposed in such areas, there will be a strong presumption in favour of preservation in situ and 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 22: Archaeology

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.

Policy 23: Listed Buildings

There will be a presumption against the demolition of Listed Buildings and a presumption in favour of consent for development involving the sympathetic restoration of a Listed Building, or other buildings of architectural value. The setting of Listed Buildings will also be safeguarded.

Policy 33: Eastern parking standards and public transport

Adequate provision for parking, public transport and servicing must be made in all new developments in conformity with Roads Authority standards and to the satisfaction of the Planning Authority.

Policy 38: Landward general policies

Developments in the landward area, as shown on Proposals Map A, on land which is not identified for a specific policy, proposal or opportunity will generally be restricted to agriculture, forestry, recreation, tourism related projects or operational developments of statutory undertakers and telecommunications operators, for which a countryside location is essential. Developments will also be judged against a series of criteria, including, a good landscape framework capable of absorbing, and if necessary, screening the development, the scale, form, colour, density and design of development should accord with the existing pattern of building, compatible with its surroundings in land use terms and should not result in a significant loss of amenity to the local community, the local road network should be capable of absorbing the development and a satisfactory access onto that network provided, sufficient spare capacity in local services to cater for the new development and the site should be large enough to accommodate the development satisfactorily in site planning terms.

Policy 47: Historic gardens and design landscapes

The Council will protect and seek to enhance the Historic Gardens and Designed Landscapes identified on Proposals Map A and any others which may be identified by Historic Scotland and Scottish Natural Heritage during the Plan period.

PERTH AND KINROSS COUNCIL LOCAL DEVELOPMENT PLAN - PROPOSED PLAN JANUARY 2012

Members will be aware that on the 30 January 2012 the Proposed Local Development Plan was published. The adopted Local Plan will eventually be replaced by the Proposed Local Development Plan (LDP). The LDP has recently undergone a period of public consultation. The Proposed Local Development Plan may be modified and will be subject to examination prior to adoption. It is not expected that the Council will be in a position to adopt the Local Development Plan before December 2014. The Plan may be regarded as a material consideration in the determination of this application, reflecting a more up to date view of the Council.

The principal relevant policies are in summary:

PM1A Placemaking

Requires all new development to contribute positively to the quality of the built and natural environment. Design and landscaping will be key requirements of any new development proposal

PM1B Placemaking

Identifies placemaking design criteria which should be satisfied by all new development.

Policy ED3: Rural Business and Diversification

The Council will generally give favourable consideration to the expansion of existing businesses and the creation of new ones in rural areas..

Policy TA1: Transport Standards and Accessibility Requirements

Encourages the retention and improvement of existing transport infrastructure.

Policy CF2: Public Access

Development proposals that would have an adverse impact upon any (proposed) core path, asserted right of way or other well used route, or that would otherwise unreasonably affect public access rights will be refused, unless those impacts are adequately addressed in the plans and suitable alternative provision is made.

Policy HE1A Scheduled Monuments

Identifies a presumption against development which would have an adverse effect on the integrity of a Scheduled Ancient Monument and its setting.

Policy HE1B Non-Designated Archaeology

Identifies that the Council will seek to protect areas or sites of known archaeological interest and their settings.

Policy HE2 Listed Buildings

The appropriateness of layout design, scale and siting of any development which affects a listed building or its setting will be carefully considered by the Council.

Policy HE4 Gardens and Designed Landscapes

The Council will seek to protect and enhance the integrity of those sites included on the current Inventory of Gardens and Designed Landscapes.

Policy NE1A International Nature Conservation Sites

Identifies that development which could have a significant effect on a SAC will only be permitted where appropriate assessment is undertaken;

Policy NE1C: Local Designations

Confirms that development which would affect an area designated as being of local nature conservation or geological interest will not normally be permitted, except where the Council as Planning Authority is satisfied that the objectives of designation and the overall integrity of the designated area would not be compromised and/or any locally significant adverse effects on the qualities for

which the area has been designated are clearly outweighed by social and economic benefits.

Policy NE1D European Protected Species

Identifies that planning permission will not be granted where development would be likely to adversely affect a European Protected species.

Policy NE3 Biodiversity

Identifies that the Council will seek to protect and enhance all wildlife and wildlife habitats. Development may be required to demonstrate that all adverse effects on species and habitats have been avoided where possible.

Policy NE4: Green Infrastructure

Provides support for the development that will contribute to the creation, protection, enhancement and management of green infrastructure.

Policy ER1A Renewable and Low Carbon Energy Generation

Provides broad support to new commercial renewable energy developments where a range of detailed criteria including biodiversity, cultural heritage, landscape character, cumulative effects and residential amenity are fully satisfied.

Policy ER6 Managing future Landscape change to conserve and enhance the diversity and quality of the area's landscape

Requires new development proposals to be compatible with the distinctive characteristics and features of the Perth & Kinross Landscape. New development proposals will be required to conserve and enhance the landscape qualities of Perth and Kinross. Identifies that the Tayside Landscape Character Assessment will be used for assessing development proposals along with other material considerations.

Policy EP2: New Development and Flooding

There will be a general presumption against proposals for built development or land raising on a functional flood plain and in areas where there is a significant probability of flooding from any source, or where the proposal would increase the probability of flooding elsewhere.

Policy EP8: Noise Pollution

Identifies a presumption against the siting of development proposals which will generate high levels of noise in the locality of existing noise sensitive uses. Identifies that conditions will be used to limit noise for developments where design and siting alone would deliver insufficient mitigation.

OTHER POLICIES

Perth & Kinross Wind Energy Policy & Guidelines (WEPG) 2005

This supplementary planning guidance was the subject of a public consultation exercise ahead of approval by Perth and Kinross Council on 18 May 2005.

Consequently, it is considered that it may be regarded as a material consideration to the current proposal.

The application site is located within an area identified in that document as 'Broad Area of Search'. The guidance document confirms there "*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.*"

The SPG has not been approved by Scottish Ministers. Accordingly, whilst the document will have value to both developers and the Council in its consideration of proposals for wind energy developments, it is the case that its weighting in the determination of this application should only be limited.

Tayside Landscape Character Assessment (TLCA)

The Tayside Landscape Character Assessment (TLCA) is published by Scottish Natural Heritage. The TLCA is a 'material consideration' when considering any development proposal in Perth and Kinross. The TLCA suggests that the overall aim of any management strategy should reflect the sensitivities of the landscape and to protect it from inappropriate development.

The Economic Impacts of Wind Farms on Scottish Tourism (2007)

Glasgow Caledonian University was commissioned in June 2007 to assess whether Government priorities for wind farms in Scotland are likely to have an economic impact – either positive or negative – on Scottish tourism. The objectives of the study were to:

- Discuss the experiences of other countries with similar characteristics.
- Quantify the size of any local or national impacts in terms of jobs and income.
- Inform tourism, renewables and planning policy.

The overall conclusion of this research is that the Scottish Government should be able to meet commitments to generate at least 50 per cent of Scotland's electricity from renewable sources by 2020 with minimal impact on the tourism industry's ambition to grow revenues by over £2 billion in real terms in the 10 years to 2015.

Four parts of Scotland were chosen as case-study areas and the local effects were also found to be small compared to the growth in tourism revenues required to meet the Government's target. The largest local effect was estimated for 'Stirling, Perth and Kinross', where the forecasted impact on tourism would mean that Gross Value Added in these two economies would be £6.3 million lower in 2015 than it would have been in the absence of any wind farms (at 2007 prices). The majority of this activity is expected to be displaced to other areas of Scotland, and the local effect on tourism should be considered alongside other local impacts of the developments – such as any jobs created in the wind power industry itself. This is equivalent to saying that tourism revenues will support between 30 and 339 jobs fewer in these economies in 2015 than they would have in the absence of all the wind farms required to

meet the current renewables obligation. Part of this adjustment will already have taken place.

The research concluded that the evidence is overwhelming that wind farms reduce the value of the scenery (although not as significantly as pylons). The evidence from the Internet Survey suggests that a few very large farms concentrated in an area might have less impact on the tourist industry than a large number of small farms scattered throughout Scotland. However, the evidence, not only in this research but also in research by Moran, commissioned by the Scottish Government, is that landscape has a measurable value that is reduced by the introduction of a wind farm.

Based on survey responses and research findings, the research in this report suggests that from a tourism perspective:

- Having a number of wind farms in sight at any point in time is undesirable from the point of view of the tourism industry.
- The loss of value when moving from medium to large developments is not as great as the initial loss. It is the basic intrusion into the landscape that generates the loss.

These suggest that to minimise negative tourist impact, very large single developments are preferable to a number of smaller developments, particularly when they occur in the same general area.

SITE HISTORY

92/01518/FUL ERECTION OF GARAGE & NEW EXTENSION AT 21 October 1992
Application Permitted

12/00819/SCRN Screening request for EIA 11 May 2012 – No EIA required

12/01568/FLL Erection of a wind turbine with access track and metre house 24
October 2012 Application - Withdrawn

CONSULTATIONS/COMMENTS

Perth And Kinross Area Archaeologist	No objections
Scottish Water	No objection
Environmental Health	No objection subject to conditions
David Williamson	No objection
Ministry Of Defence	No objection

Transport Planning	No objection
Mount Blair Community Council	No response within statutory period
Angus Council	No response within statutory period

TARGET DATE: 7 January 2013

REPRESENTATIONS RECEIVED: Yes

Number Received: Three

Summary of issues raised:

All in support of application due to close proximity to existing wind infrastructure.

Response to issues raised by objectors: See officer's report above

Additional Statements Received: Not required

Environment Statement Not required

Screening Opinion Yes

Environmental Impact Assessment No

Appropriate Assessment Not required

Design Statement or Design and Access Statement Not required

Report on Impact or Potential Impact eg Flood Risk Assessment Not required

Legal Agreement Required: Not required

Summary of terms Not required

Direction by Scottish Ministers Not required

Reason for Refusal:-

- 1 The proposed siting of the turbine, remote from the existing turbine grouping at Drumderg Wind Farm, extends wind development along the Highland Boundary Fault to the detriment of visual amenity and landscape character. The proposal will also have a detrimental cumulative impact on landscape

character. The Council is not satisfied that the energy contribution of the proposed turbine would outweigh the adverse effects on local environmental quality. Accordingly, the proposal is contrary to National Scottish Planning Policy (SPP), Policy 6 of the approved TAYplan 2012; and Policies 2, 9, 38 of the Eastern Area Local Plan 1998 and Policies PM1A, ER1A and ER6 of the Proposed Local Development Plan.

Justification

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

Notes

None

TCP/11/16(256)

Planning Application 12/01934/FLL – Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally, Blairgowrie, PH10 7JX

REPRESENTATIONS

- Representation from Biodiversity Officer, dated 14 November 2012
- Letter of support from Councillor Caroline Shiers, dated 19 November 2012
- Letter of support from Councillor Bob Ellis, dated 19 November 2012
- Letter of support from Murdo Fraser MSP, dated 19 November 2012
- Representation from Ministry of Defence, dated 20 November 2012
- Representation from Environmental Health Manager, dated 21 November 2012
- Representation from Ministry of Defence, dated 11 June 2013
- Representation from Councillor Caroline Shiers, dated 16 June 2013

Memorandum

To John Williamson

From David Williamson
Biodiversity Officer

Your ref 12/01934/FLL

Our ref

Date 14 November 2012

Tel No 01738 475278

The Environment Service

Pullar House, 35 Kinnoull Street, Perth PH1 5GD

John,

Planning Application 12/01934/FLL Erection of a wind turbine, meter house and associated access track The Corb Bridge Of Cally Blairgowrie PH10 7JX

With regard to the above Planning Application, in general, I am satisfied with the approach taken regarding the ecological information, however on checking records I hold on GIS there are a number of protected species within 2km of the proposed site.

The species recorded within 2km of the turbine site that could possibly be adversely affected are:

- Whorled Solomon's Seal
- Bluebell
- Natterer's Bat
- Brown Long-eared Bat
- Short-eared Owl

The turbine is located in such a way that bats are not likely to be affected, and while Short-eared Owl is confirmed as nesting in the vicinity a single turbine will have a low impact on this species. The two plant species are found in woodland and so will not be affected by the development.

Based on the above information, and the scale of the development I am satisfied there will be little or no impact on any of these species.

If you have any queries regarding the above please do not hesitate to contact me.

Yours faithfully,

David Williamson

JW

CS/LJC



2 High Street
Perth PH1 5PH
Tel: 01738 475000
Fax: 01738 475007
Email: cshiers@pkc.gov.uk



19 November 2012

www.pkc.gov.uk

Mr Nick Brian
Quality Development Manager
Perth & Kinross Council
Pullar House
35 Kinnoull Street
PERTH

RECEIVED

20 NOV 2012

Councillor Caroline Shiers
49 Airlie Street
ALYTH
Perthshire
PH11 8AJ

Tel: 01828 632 608

Scottish Conservative

Dear Mr Brian

Mr Norman Bailey, The Corb, Bridge of Cally
Ref: 12/01934/FLL

I write in support of the above application for a single turbine on Corb Hill on environmental grounds.

Given the proliferation of Wind Farms across Perth & Kinross and the proximity of this site to Drumderg Windfarm the visual impact of a single turbine would be minimal.

I presume also given the infrastructure in place to support Drumderg the impact of construction would be minimised also and therefore the economic benefit of this one turbine would be a positive one.

Yours sincerely

[Redacted signature]

Councillor Caroline Shiers
Ward 3, Blairgowrie & Glens





OW

BE/MW

19 November 2012

Mr Nick Brian
Development Quality Manager
Perth & Kinross Council
Pullar House
35 Kinnoull Street
PERTH
PH1 5GT

2 High Street
Perth PH1 5PH
Tel: 01738 475000
Fax: 01738 475007

Councillor Bob Ellis
15 Ann Street
BLAIRGOWRIE
PH10 6EF

Tel: 01250 873899

Email: rsellis@pkc.gov.uk



RECEIVED
20 NOV 2012

Dear Mr Brian

**Ref Application 12/01934/FLL
Erection of a Wind Turbine with Access Track and Metre House
The Corb, Bridge of Cally, PH10 7JX**

I would like to submit this letter as a letter of support for Mr & Mrs Norman Bailey on the above planning application.

Although this single wind turbine is 14 metres higher than the previous application submitted to you it will still obviously not have any visual or environmental effect on the area as there are already numerous wind turbines in the immediate area on Drumderg and they are all in the region of 26 metres higher.

I have also not had any adverse comments on this application and would hope that this can be decided under delegated powers. I understand that the Bailey's were asked by the Service to withdraw their previous application and submit one for a larger wind turbine.

The Drumderg wind farm has had an effect on Mr & Mrs Bailey's property and as a result I am aware that there has been a reduction in their Council Tax banding and this has been welcomed. If their application is granted, then this will also assist them to receive other financial income, which would be of great benefit to them given their present circumstances, where they reside.

I sincerely hope that this letter go a long way to assisting you make the right decision, which is to grant approval.

Yours sincerely

Councillor Bob Ellis





The Scottish Parliament
Pàrlamaid na h-Alba

PERTH AND KINROSS COUNCIL
THE ENVIRONMENT SERVICE

MURDO FRASER MSP

Mid Scotland & Fife

DATE

21 NOV 2012

REPLY DATE

NB

FILE

593795

12/12/12

ENQUIRY / SERVICE REQUEST

RECEIVED

21 NOV 2012

Planning Department
Perth & Kinross Council
Pullar House,
35 Kinnoull Street,
Perth
PH1 5GD

Monday, 19 November 2012

Dear Sir or Madam,

Planning Application Reference: 12/01934/FLL

I am writing in support of the application for a single wind turbine on Corb Hill submitted by Mr and Mrs Bailey.

I have serious concerns about the proliferation of wind turbines across Perth and Kinross, and have objected to a number of large scale developments. However, I accept the inevitability of further developments because of current government policy. Given this, it seems to me preferable that any future wind turbines should be erected in close proximity to existing developments, in order to cluster together the visual and environmental impact. This would then allow other areas to be protected entirely from such developments.

I understand the reasons why Mr and Mrs Bailey are submitting this application, and in particular the blight on their property from the adjacent Drumderg wind farm. In the circumstances it would be quite unfair should their own application be refused.

Yours faithfully,



Murdo Fraser MSP

Member for Mid Scotland & Fife (Scottish Conservatives)

The Scottish Parliament
Edinburgh EH99 1SP
Tel: 0131 348 5646 Fax: 0131 348 5933
murdo.fraser.msp@scottish.parliament.uk www.conservativemsp.com



MINISTRY OF DEFENCE

Mr John Williamson
Planning Department
Perth & Kinross Council
Pullar House
35 Kinnoull Street
Perth
PH1 5GD

Defence Infrastructure Organisation

Case officer: Dominic Martin
Safeguarding Assistant
Safeguarding - Wind Energy
Defence Infrastructure Organisation
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

Tel: 0121 311 2195
Facsimile: 0121 311 2218
E-mail: DIOOpsNorth-LMS7a2b1@MOD.uk
Internet Site: www.defence-estates.MOD.uk

20th November 2012

Your Reference: 12/01934/FLL

Our Reference: DIO/C/SUT/43/10/1/17250

Dear Mr Williamson

DIO Reference Number: 17250

Site Name: The Corb

Application Number: 12/01934/FLL

Proposal: Erection of 1 Wind Turbine

Site: Bridge of Cally, Blairgowrie

Thank you for consulting the Ministry of Defence (MOD) on the above Planning Application dated 9th November 2012.

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

The application is for 1 turbine at 84 metres to blade tip. This has been assessed using the grid references below as submitted in your pro-forma.

Turbine	100km Square Letter	Easting	Northing
1	NO	16400	57043

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

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

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

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

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

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

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

Any queries regarding this letter should be addressed to the Case Officer using the above contact details.

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

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

Yours sincerely

Dominic Martin
Defence Infrastructure Organisation

SAFEGUARDING SOLUTIONS TO DEFENCE NEEDS

Memorandum

To Development Quality Manager

From Environmental Health Manager

Your ref PK12/01934/FLL

Our ref LRE/KIM

Tel No 01738 476462

Date 21 November 2012

The Environment Service

Pullar House, 35 Kinnoull Street, Perth PH1 5GD

Consultation on an Application for Planning Permission

RE: Erection of a wind turbine, meter house and associated access track The Corb Bridge of Cally Blairgowrie PH10 7JX for Mr Norman Bailey.

I refer to your letter dated 9 November 2012 in connection with the above application and have the following comments to make.

Environmental Health

Recommendation

I have no objections in principle to the application but recommend the undernoted conditions be included in any given consent.

Comments

The applicant proposes to erect a single 850kW wind turbine with a 55metre hub height.

The application site is more than 220metres from the nearest residential property The Corb Farmhouse which is the ownership of the applicant. The closest residential property that does not have a financial in the application is over 2km away.

The applicant had submitted a previous application 12/01568/FLL for the installation of a single 850kW turbine with a 44 metre hub height at the same location. This application was withdrawn on request of the planning authority, due to visual impact with the Drumderg Wind Farm 1 km to the southeast of the Corb site and recommended the applicant resubmit with an increased hub height for visual uniformity with existing turbines.

Noise

This Service made comment in the 12/01568/FLL application in memorandum dated 3 October 2012 with regards to noise. This application is for the same location as the previous withdrawn application, therefore I reiterate the previous comments and conditions, to comply with the simplified noise condition for single turbines as recommended by Planning Advice Note (PAN) 1 and ETSU-R-97.

Shadow Flicker

Shadow Flicker in accordance to Scottish Governments national planning policy document for onshore wind turbines states;

“Under certain combinations of geographical position, time of day and time of year, sun may pass behind the rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off; the effect is known as “shadow flicker”. It occurs only within buildings where the flicker appears through a narrow window opening.”

Where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem. However, there is scope to vary layout / reduce the height of turbines in extreme cases.

It is my contention that as the closest property outwith the applicant's ownership is over 2 km away shadow flicker is not an issue.

Conditions

1. 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 of that audible tones are generated by the wind turbine, a 5dB (A) penalty for tonal noise shall be added to the measured noise levels.
2. On a formal written request by the Council as Planning Authority, appropriate measurements and assessment of the noise arising from the wind turbine (carried out in accordance with ETSU report for the DTI - The Assessment and Rating of Noise from Wind Farms (ETSU-R-97) shall be submitted for the approval in writing by the Council as Planning Authority

Water

Recommendation

As per the comments made for 12/01568/FLL I have no objections to the application but recommend the undernoted informative be included in any given consent. The wind turbine and access tracks proposed are in a rural area, and will be located near a property known to be served by a private water supply (Corb Supply). No objections relating to private water supplies were noted at the date of this memorandum. To ensure the private water supply or septic drainage systems of properties in the vicinity of the development remain accessible for future maintenance.

Informative

The applicant should ensure that any existing wayleaves for maintenance or repair to existing private water supply or septic drainage infrastructure in the development area are honoured throughout and after completion of the development.





Defence Infrastructure Organisation

Your Ref. TCP/11/16 (256)
DIO Ref. DE/C/SUT/43/10/1/17250

Ministry of Defence
Safeguarding
Kingston Road
Sutton Coldfield
West Midlands B75 7RL
United Kingdom

Telephone [MOD]: +44 (0)121 311 2443
Facsimile [MOD]: +44 (0)121 311 2218
E-mail: dioopsnorth-lms7b@mod.uk

Perth & Kinross Local Review Body
Clerk – Gillian Taylor
2 High Street,
Perth
PH1 5PH

11 June 2013

Dear Sirs,

Town and Country Planning (Scotland) Act 1997

Application Ref: 12/01934/FLL – Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally, Blairgowrie, PH10 7JX

The Ministry of Defence (MOD) has received notification from Perth and Kinross Council that the decision on the above planning application will be reviewed by the Council's Local Review Body.

The MOD submitted a response dated 20th November 2012 to Perth and Kinross Council raising no objection to the proposal and requesting the inclusion of a condition on any planning consent that suitable aviation lighting is installed.

The MOD has reviewed this response in light of the deferral and I can confirm that the MOD raises no objection to the proposal. The MOD requests that the turbine is fitted with aviation lighting of the following specification; *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 200ms to 500ms duration at the highest practicable point.*

I trust that the above will be taken into account during the applications consideration. Should you require any additional information, please do not hesitate to contact me.

Yours faithfully

Lucy Hodgetts
BSc (Hons) MA MRTPI
Senior Safeguarding Officer (Engagements)

CS/SW

19 June 2013

Local Review Body
Perth & Kinross Council

2 High Street
Perth PH1 5PH
Tel: 01738 475000
Fax: 01738 475007
Email: cshiers@pkc.gov.uk

www.pkc.gov.uk

Councillor Caroline Shiers
49 Airlie Street
ALYTH
Perthshire
PH11 8AJ

Tel: 01828 632 608

Scottish Conservative



Dear Members

APPLICATION - 12/01934/FLL - Wind Turbine at the Corb, Bridge of Cally

I write to give my full support to Mr and Mrs Bailey and their application to have a review of the refusal decision on their planning application noted above. I have been in contact with Mr and Mrs Bailey all through the application process and I am aware that, at every stage, they have done what was required of them to ensure all information and evidence was submitted in support of their proposal. They have had to amend and resubmit the application several times and been asked for information that seemed very inappropriate for a single turbine application.

As a local member for the Blairgowrie and Glens Ward I would draw the attention of the LRB to the fact that there have been no objections from any of the statutory consultees or the public. This application has also drawn support from across the political spectrum locally.

Due to the amount of information in relation to this case there is a summary below of the key points which I would respectfully ask the Members of the LRB to consider. These points will also feature in the comments from Mr and Mrs Bailey and provide a clear picture of why I am willing to offer them my support:

1. This is a "wind farm landscape" with existing Drumderg Wind Farm impacting a limited section of the Highland Boundary Fault line of mountains. Adjacent to this wind farm is the applicant's property and residence, impacted (and "devalued") by large turbine typologies in close proximity.
2. To compensate for devalued property, the applicant is looking to diversify private land-use into wind energy with like development in the form of a single turbine (84m to tip) which would generate power to assist in P&K targets for National Energy goals and provide income.

3. The extent of development in terms of the baseline landscape and resultant effects on local receptors is negligible. Zone of Theoretical Visibility (ZTV) mapping prepared and presented shows the limited extent of impact on concentrations of more sensitive receptors within the local and wider landscape (most notably the groupings of settlement in lowland valleys – Strathmore, at +/-20km distance).
4. While the dramatic line of the highland fault is impacted to a degree by Drumderg Wind Farm, the slight addition of the proposed Corb turbine does not significantly extend this impact along the line.
5. Closer upland areas are currently impacted in a small percentage of views by existing Drumderg Wind Farm. The addition of the proposed Corb turbine into this immediate landscape does not provide additional effect deemed unacceptable in terms of National Planning Policy Framework or Local Development Plan.
6. The photomontages (3) that the Council Officer has refused the proposal on have a lower significance to the others. 6 of 9 viewpoints cover a range of receptor types, sensitivities and distances to proposed development, and show the proposal at the Corb to be visually read as part of Drumderg Wind Farm.
7. The turbine location for the application was selected per P&K concern over adjacent SAC and proximity to. Through pre-application meeting with P&K Planning Officer it was agreed that a larger turbine in that location would be acceptable and looked favourably upon with proximity to Drumderg being a sound mitigation factor. After the meeting with John and Douglas, it was decided they would prefer the turbine in the location which was chosen for screening – resulting in the withdrawal and re-submission of an application – waste of time and money. The application had already been withdrawn and re-submitted once to allow for this larger size.
8. In the face of NO public objection, NO multiple statutory consultee objection, and compliance with P&K Guidance for siting/mitigating wind energy development, the project was refused on thin landscape grounds presented by ONE landscape advisor. Decision made by limited OPINION over subjective Policy. Site is in a Broad Area of Search for wind energy, follows best practice and guidance in location (determined by ALL site constraints), and is deemed to be in accordance with Local Development Plan for renewables.

Yours sincerely



Councillor Caroline Shiers
Ward 3, Blairgowrie & Glens

TCP/11/16(256)

Planning Application 12/01934/FLL – Erection of a wind turbine, meter house and associated access track at The Corb, Bridge of Cally, Blairgowrie, PH10 7JX

WRITTEN SUBMISSION

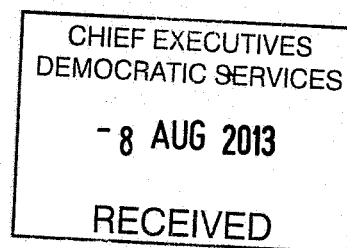
- Map from Agent requested for site visit
- Email from Appointed Officer, dated 28 August 2013



Renewable Technology Specialists

Waterside Farm
Glasgow Road
Galston
KA4 8PB
t: 01563 829990
f: 01563 829383
e: info@vgenergy.co.uk
w: www.vgenergy.co.uk

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



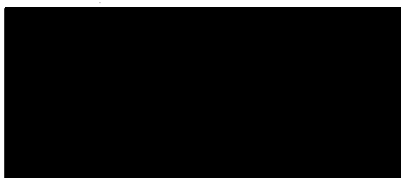
Dear Sir/Madam,

07/08/13

Please find enclosed further site map showing the development at The Corb Bridge of Cally, PH10 7JX (Appeal Reference: **TCP/11/16 (256)**). The map also highlights the windfarms of Drumderg and Tullymurdoch. This map was requested at the Local Review Body hearing 06.08.13 to aid the unaccompanied site visit.

If you have any further questions regarding the appeal please do not hesitate to contact me.

Yours Faithfully,



Erin Fairley

Planning and Environmental Consultant
Tel: 01563 829 999
e-mail: Erin.Fairley@vgenergy.co.uk

CHX Planning Local Review Body - Generic Email Account

From: John Williamson
Sent: 28 August 2013 07:47
To: CHX Planning Local Review Body - Generic Email Account
Subject: RE: LRB - 256
Attachments: 13.08.15 - N Brian (256).doc; TCP-11-16(256) - 13.08.07 - Further information from Agent.pdf

Dear Sir/Madam

I refer to the above attached documents which have been submitted as further information in relation to the above LRB case and confirm that the Planning Authority has no comment to make on the document.

Kind Regards

John Williamson
Planning Officer- Planning & Regeneration
Perth and Kinross Council
The Environment Service
Pullar House
35 Kinnoull Street
Perth
PH1 5GD

