

NOTICE OF REVIEW

UNDER SECTION 43A(8) OF THE TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997 (AS AMENDED) IN RESPECT OF DECISIONS ON LOCAL DEVELOPMENTS

THE TOWN AND COUNTRY PLANNING (SCHEMES OF DELEGATION AND LOCAL REVIEW PROCEDURE) (SCOTLAND) REGULATIONS 2008

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

IMPORTANT: Please read and follow the guidance notes provided when completing this form. Failure to supply all the relevant information could invalidate your notice of review.

Use **BLOCK CAPITALS** if completing in manuscript

Applicant(s)

Name

Address

Postcode

Contact Telephone 1

Contact Telephone 2

Fax No

E-mail*

Agent (if any)

Name

Address

Postcode

Contact Telephone 1

Contact Telephone 2

Fax No

E-mail*

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

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

Yes No
X

Planning authority

Planning authority's application reference number

Site address

Description of proposed development

Date of application Date of decision (if any)

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

Nature of application

- 1. Application for planning permission (including householder application)
- 2. Application for planning permission in principle
- 3. Further application (including development that has not yet commenced and where a time limit has been imposed; renewal of planning permission; and/or modification, variation or removal of a planning condition)
- 4. Application for approval of matters specified in conditions

Reasons for seeking review

- 1. Refusal of application by appointed officer
- 2. Failure by appointed officer to determine the application within the period allowed for determination of the application
- 3. Conditions imposed on consent by appointed officer

Review procedure

The Local Review Body will decide on the procedure to be used to determine your review and may at any time during the review process require that further information or representations be made to enable them to determine the review. Further information may be required by one or a combination of procedures, such as: written submissions; the holding of one or more hearing sessions and/or inspecting the land which is the subject of the review case.

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

- 1. Further written submissions
- 2. One or more hearing sessions
- 3. Site inspection
- 4. Assessment of review documents only, with no further procedure

If you have marked box 1 or 2, please explain here which of the matters (as set out in your statement below) you believe ought to be subject of that procedure, and why you consider further submissions or a hearing are necessary:

Site inspection

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

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

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

Statement

You must state, in full, why you are seeking a review on your application. Your statement must set out all matters you consider require to be taken into account in determining your review. Note: you may not have a further opportunity to add to your statement of review at a later date. It is therefore essential that you submit with your notice of review, all necessary information and evidence that you rely on and wish the Local Review Body to consider as part of your review.

If the Local Review Body issues a notice requesting further information from any other person or body, you will have a period of 14 days in which to comment on any additional matter which has been raised by that person or body.

State here the reasons for your notice of review and all matters you wish to raise. If necessary, this can be continued or provided in full in a separate document. You may also submit additional documentation with this form.

See attached Local Review Statement.

Have you raised any matters which were not before the appointed officer at the time the determination on your application was made? Yes No

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

List of documents and evidence

Please provide a list of all supporting documents, materials and evidence which you wish to submit with your notice of review and intend to rely on in support of your review.

Planning Application Documents
 Further Roads and Transportation
 Further Viewpoints and Wireframes
 Letter from applicant to Council dated 13th December 2013
 Email from applicant to Council dated 13th February 2014
 Email from Council to applicant dated 25th February 2014

Note. The planning authority will make a copy of the notice of review, the review documents and any notice of the procedure of the review available for inspection at an office of the planning authority until such time as the review is determined. It may also be available on the planning authority website.

Checklist

Please mark the appropriate boxes to confirm you have provided all supporting documents and evidence relevant to your review:

- Full completion of all parts of this form
- Statement of your reasons for requiring a review
- All documents, materials and evidence which you intend to rely on (e.g. plans and drawings or other documents) which are now the subject of this review.

Note. Where the review relates to a further application e.g. renewal of planning permission or modification, variation or removal of a planning condition or where it relates to an application for approval of matters specified in conditions, it is advisable to provide the application reference number, approved plans and decision notice from that earlier consent.

Declaration

I the applicant/agent [delete as appropriate] hereby serve notice on the planning authority to review the application as set out on this form and in the supporting documents.

Signed


 Paul Houghton for Houghton Planning

Date

18th March 2014

LOCAL REVIEW STATEMENT

Arivore Farm, Whitehouse, Tarbert, Argyll and Bute, PA29 6XR

ON BEHALF OF: Fine Energy

PREPARED BY: Houghton
Planning

DATE: 18th March 2014

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1.0 INTRODUCTION

Background

- 1.1 This local review statement relates to a planning application (ref: 13/02164/PP) for the erection of one wind turbine, associated plant, and access track, at land north east of Arivore Farm, Whitehouse, Tarbert, Argyll And Bute, PA29 6XR.
- 1.2 The planning application was registered on 21st October 2013, and the statutory two month determination period expired on 21st December 2013.
- 1.3 It should be noted that the application was originally submitted with the intention of erecting two wind turbines. However, in an attempt to meet concerns raised by the case officer, as to the level of visual impact, the decision was taken by the applicant, by email dated 13th February 2014 (copy enclosed), to amend the application to a single turbine. It was hoped that this would have resulted in the case officer supporting the proposal, but by email dated 25th February 2014 (copy enclosed) it was made clear that the amended proposal would still not be considered favourably. The reasons for this, and the applicant's response, are detailed in Section 4.0 below.
- 1.4 The planning application was accompanied by a suite of supporting documents, including a Planning Supporting Statement and Cumulative Landscape and Visual Impact Assessment, and the local review body is particularly requested to read these two documents in full in coming to a decision. ZTVs and various visualisations have also been produced, and the local review body is requested to have these available at its hoped for site visit. This includes additional wireframes and photomontages that were prepared following dialogue with the case officer, and following the amendment of the planning application from two to one turbine.
- 1.5 A local review is being sought against the non-determination of the application, and is being submitted within three months of the end of the statutory two month determination period.
- 1.6 The applicant is Fine Energy, although the farmer, Mrs M Dewar, who owns the application site, and adjoining land, will benefit financially from the turbine securing planning permission. This will aid the continuing viability and financial security of her overall farming operation by allowing her to improve the overall quality of the land and her livestock. The farm has also lost two shed roofs, due to the high winds over the past year, and any money generated will go towards replacing these, as well as more general repairs to the main farm building.

- 1.7 Mrs Dewar has been actively involved throughout the application process, and is very keen to see this application determined favourably. She very reluctantly agreed to the amendment of the planning application from two turbines to one, given the significant impact this would have on her financial return, but hoped that by doing so she would at least secure officer support. As it has transpired, this has not happened leaving her extremely frustrated with the overall planning process.

Proposed Development

- 1.8 The single wind turbine proposed will have a maximum hub height of up to 25m, a rotor diameter of 19.2m, with a maximum blade tip height, when the rotor blades are in a vertical position that will not exceed 34.6m.
- 1.9 Associated works include concrete foundations for the turbines, a small control cabinet, and the creation of a new temporary farm track to allow the turbines to be erected. New cables will be laid underground between the turbines and the proposed connection to the national grid network

Consultation Responses/Representations

- 1.10 **Argyll and Bute Environmental Health** – No objection – Recommends a condition be attached to any planning permission granted, the wording of which is acceptable to the applicant.
- 1.11 **Argyll and Bute Roads** – No objection – Recommend that conditions are attached to any planning permission granted, and these are again acceptable to the applicant.
- 1.12 **Glasgow Prestwick Airport** – No objection.
- 1.13 **NATS Safeguarding** – No objection.
- 1.14 There has only been one letter of objection, from an individual who is not local to the area, and regularly objects to turbine applications across Scotland on a variety of grounds.
- 1.15 Importantly, and unusually, there are no local objections at all to this turbine. This will hopefully carry weight in the determination of this local review.

2.0 THE APPLICATION SITE

- 2.1 The proposed development is located within predominantly agricultural and wooded land, just under 1km east of the village of Whitehouse, Argyll and Bute.
- 2.2 The site does not fall within, or upon, any designated sites of ecological, scientific, historic, or archaeological, interest.
- 2.3 The area falls into a combination of the "Upland Forest-Moor Mosaic" and the "Rocky Mosaic" landscape character designation (as per the SNH Landscape assessment of Argyll and the Firth of Clyde - Environmental Resources Management).
- 2.4 The proposed site is located on land which is on a gradual upslope leading away from the coastal edge. The surrounding area has been extensively changed over time, with inclusion of minor roads, settlements and man-made field boundary walls, with additional field coverage from nearby woodland.
- 2.5 Although the proposed site falls into two separate landscape characteristics, the Rocky Mosaic landscape characteristic gives the most accurate assessment of the surrounding area, with its description of the landscape as having: uneven, hummocky landform, with rocky outcrops; narrow glens, with a scattering of isolated farm buildings and small villages in sheltered sites; and with stone walls providing partial enclosure to fields.
- 2.6 The field, within which the proposed turbine is positioned, is situated in the northerly portion of the farm, and is adjacent to the wooded area 440 metres north of Arivore Farm. This land has been used for beef and sheep farming for several years.
- 2.7 The cultural assets have been identified in the immediate area, and presented in drawing no. HAP01-ZTV (enclosed). The area benefits from only disparate and sporadic siting of historically important buildings and monuments, and none are considered to be impacted upon by the proposed turbine.
- 2.8 The natural and landscape assets have also been identified within 5 kilometres, and included on drawing no. NAT.LAN.01 (enclosed). Again, none are close enough to be impacted upon by the proposed turbine.
- 2.9 There is a Core Path reasonably close to the application site, and shown on drawing no. HAP01-ZTV, although visual impact from this has never been identified as an issue.

- 2.10 The nearest settlement of Whitehouse is just less than 1 kilometre to the west of the proposed site. This is far enough way, and the landscape such, that there will be no adverse impact upon it in terms of visual impact or noise.
- 2.11 The nearest dwellings to the turbine are in excess of 300 metres away. The closest is Tigh Nan Cnoc at 330 metres, and the next nearest is 352 metres away. These are considered to be far enough away not to cause any concerns with regard to shadow flicker, visual impact or noise.

3.0 PLANNING POLICY AND GUIDANCE

- 3.1 Section 25 of the 1997 Act, as amended, requires applications to be determined in accordance with the development plan unless material considerations indicated otherwise.
- 3.2 The development plan in this case comprises the approved Argyll and Bute Structure Plan (2002) and the adopted Argyll and Bute Local Plan (2009). Emerging planning policy can be found in the Argyll and Bute Local Development Plan. Policies within these generally support renewable energy proposals, provided that they do not cause unacceptable harm to interests of acknowledged importance.
- 3.3 SPP sets out national policy regarding renewable energy proposals; whilst separately the Scottish Government web-based renewables advice identifies a number of factors to be taken into account in determining the location of turbines.
- 3.4 Also of importance is national policy, which supports the renewable energy sector and how it can provide for the energy requirements of the country in the 21st century, and can also provide for new employment opportunities, particularly in rural areas.
- 3.5 The most recent expression of this is to be found in the Government's Renewables Action Plan, which sets out some ambitious targets for Scotland going forward in terms of reducing carbon emissions. It sets a target that by 2020 100% of Scotland's electricity is to be generated from renewable sources. Similarly, a target has been set for renewables sources to provide the equivalent of 11 per cent of Scotland's heat demand by 2020. The Government wants targets to be exceeded, rather than merely met, and they should not be viewed as a cap on what renewables can deliver.
- 3.6 There is no definitive statement in any planning or other policy document giving advice to local planning authorities as to how to determine turbine applications. Our view, based upon experience, and specifically the way planning appeals are being determined, is that provided the technical aspects of wind are dealt with (i.e. ecology, aviation, telecoms, residential amenity etc) the decision rests upon the weight given to national energy policy versus landscape and visual impact. Those applications where the latter is significant are generally refused; whereas where some visual harm is apparent, but this is judged not to be significant, the need for renewable energy can tip the scales towards an approval. It is hoped that the local review body will judge this case on this same basis.

4.0 PLANNING ISSUES

- 4.1 The planning issues relating to this planning application are best considered under the following headings: Landscape and Visual Impact, Cumulative Impact, Compatibility with Existing Land Uses, Protected Species and Habitats, Impact on the Historic Environment, Noise, Shadow Flicker, Roads, and Aviation.
- 4.2 **Landscape and Visual Impact** – It is generally accepted that turbines will be visible in any given landscape, and visibility in itself should not be a reason for refusal in our opinion. Instead, that degree of visibility should be significant, and harmful, and, it is suggested, should reflect an impact on a wide body of persons potentially using that landscape/local area. So, for example, a well-used footpath route used by walkers, where their immersion in that landscape is likely to be for some considerable period of time, and where their visit to that area is to specifically appreciate it, is likely to carry more weight than where most visitors are in cars and transitory.
- 4.3 With this in mind, it is suggested that we are not dealing here with a significantly important landscape. It is clearly important locally, but as it has not been designated as of national or regional importance, it can absorb, it is suggested, a greater impact from the introduction of new manmade features, such as wind turbines, and without any significant impact, than one where importance has been so defined.
- 4.4 That would appear to be something in relation to which both the applicant and case officer are in agreement, as in correspondence the case officer has not stressed landscape harm, but has tended to restrict himself to visual impact, which is considered next.
- 4.5 The visual impact of the original two turbines, and now the single turbine, has exercised the case officer to a great extent. It is fair to say that his view was clear that two turbines would cause significant visual harm, but in terms of just one turbine his views have wavered from being relaxed to being concerned.
- 4.6 Over the course of the last two months there has been extensive dialogue between the case officer and applicant, which led to a two turbine scheme being reduced to one, and included the submission of further wireframes and photomontages. It also led to the applicant outlining the case for why the turbines would be acceptable in a letter dated 11th December 2013, the content of which remains relevant to the current single turbine (copy enclosed). This dialogue eventually culminated in an email from the case officer, dated 10th February 2014, that gave some encouragement to the applicant that a single turbine would be acceptable. However, following the submission of further information, as requested by the case officer, this positive

attitude had again become one of concern, and by an email dated 25th of February, it became clear that the application was likely to be refused. The submission of the local review anticipates that likely refusal.

- 4.7 The concern raised by the case officer is one of a very specific visual impact from the A83. The case officer considers that the turbine would appear industrial in scale, in an agricultural landscape, and with it having no visual association with any existing development, would be harmful. The applicant is of the view that this impact is not of that magnitude, and by virtue of the distances involved, and intervening planting, it will not have a significant impact. That impact anyway mainly affecting drivers who will be travelling at speed along this road.
- 4.8 It is clear that the above issue is finely balanced. Even the case officer has wavered in his opinion. It is, therefore, a matter that will be best understood by councillors undertaking a site visit.
- 4.9 It should also be stressed (again) that in considering this issue, councillors will hopefully appreciate that any turbine will always have a visual impact, and that the first question to ask is will that impact be significant, and affect a substantial number of local people. If the answer to that is no, then we respectfully request that the balance should be favour of planning permission being granted given the wider importance of renewable energy, and, in this case, also by the particular benefit to Mrs Dewar.
- 4.10 **Cumulative Impact** – There is no issue between the case officer and applicant in this regard. There are other turbines in the wider area, but none are considered to be close enough to be of cumulative concern with the single turbine proposed here.
- 4.11 **Compatibility with Existing Land Uses** – The nearest settlement is approximately 1 kilometre away, and the nearest dwelling over 300 metres. The single turbine is, therefore, considered to be suitably separated from these.
- 4.12 **Protected Species and Habitats** – No issues in this regard have been raised.
- 4.13 **Impact on the Historic Environment** – Due to the distance away of sites of historic importance, there is considered to be no issue in this regard.
- 4.14 **Noise** – Levels predicted in the submitted noise assessment are within the Council's recommended levels, and the Council's Environmental Health section accepts this and recommends conditions.
- 4.15 **Shadow Flicker** - The Scottish Government's specific advice document "Onshore Wind Turbines" advises that a separation distance of 10 rotor diameters should be

provided between wind turbines and nearby dwellings. In this case, that would equate to 195 metres. Outwith this distance shadow flicker should not be a problem. The nearest dwelling is over 300 metres away.

- 4.16 **Roads** – The Council's Roads section initially raised concerns, but through the submission of further information they have accepted that a conditional planning permission is acceptable to them.
- 4.17 **Aviation** – Not an issue. Glasgow Prestwick Airport and NATS have responded, and stated that they have no objection.

5.0 CONCLUSION

- 5.1 For the reasons given above, it is considered that the proposed turbine complies with prevailing planning policy and other Council requirements.
- 5.2 There will be a degree of visual impact, but not such that this should be viewed as significant. It is more than outweighed anyway, in our opinion, by the incentive to support the renewables sector in Scottish Government planning and energy policy documents. It should also be weighed against the economic benefit to Mrs Dewar of the turbine going ahead, which will help her pay for repairs to her farm, and aid its continued viability.
- 5.3 For all the reasons given in this statement, and based upon the supporting information submitted with the planning application, it is respectfully requested that the local review body grant conditional planning permission.



Planning Support Statement

Proposed Erection of 2no. Small-scale Wind Turbines
Arivore Farm, Whitehouse, Tarbert, Argyll and Bute,
PA29 6XR.

Author: Stuart K. Scott BSc(Hons), MSc.

A handwritten signature in black ink, appearing to read "Stuart K. Scott".

Checked by: Lee S. Houghton BSc(Hons), MLA

A handwritten signature in black ink, appearing to read "Lee S. Houghton".

Fine Energy Ltd.
9 Kingsknowe Park,
Edinburgh,
EH14 2JQ

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1.0 Introduction

This statement has been submitted in support of an application to erect and operate 2no. Endurance E-3120 wind turbines on 24m monopole tubular towers (with an overall rotor tip height of 34.5m) at Arivore Farm, Tarbert, Argyll and Bute – for a period of 20 years.

It is confirmed that Fine Energy are the applicant for the proposals and the landowner (Margaret Dewar) is aware of the proposals and has been notified as part of the submission of this planning application.

Fine Energy has requested an EIA screening report for the proposals (requested 24th May 2013). Acknowledgement receipt of the screening letter, sent by case officer David Love, was received on the 3rd June 2013. To date, no further comment or advise as has been sent regarding the proposed application.

This document will begin by addressing the site and its relationship to the surrounding area, then the proposed development and any associated works will be described in greater detail. This document shall also set-out the local plan policies relevant to the proposal as well as addressing all of the potential design and access, technical and environmental implications relevant to a development of this size and scale.

2.0 Site and Surrounding Area

The proposed development is located within predominantly agricultural and wooded land, just under 1km east of the village of Whitehouse, Argyll and Bute. The site does not fall within or upon any designated sites of ecological, scientific, historic or archaeological interest.

The area falls into a combination of the "Upland Forest-Moor Mosaic" and the "Rocky Mosaic" landscape character designation (as per the SNH Landscape assessment of Argyll and the Firth of Clyde - Environmental Resources Management).

The proposed site is located on land which is on a gradual upslope leading away from the coastal edge. The surrounding area has been extensively changed over time with inclusion of minor roads, settlements and man-made field boundary walls, with additional field coverage from nearby woodland. Although the proposed site falls into two separate landscape characteristics the Rocky Mosaic landscape characteristic gives the most accurate assessment of the surrounding area with the local plans describing the landscape as having uneven, hummocky landform with rocky outcrops and narrow glens with a scattered isolated farm buildings and small villages in sheltered sites with stone walls providing partial enclosure.

The landowner farm boundary is spread over two large field boundaries with the related area extending to approximately 133.7ha. The field in which the proposed turbines are positioned is

situated in the northerly portion of the landowner's boundary and is adjacent to the wooded area 440m north of Arivore Farm. This land has been used for beef and sheep farming for several years.

The cultural assets have been identified in the immediate area and presented in drawing no. HAP01-ZTV (see Appendix 2) and it is summarised that the area benefits from only disparate and sporadic siting of historically important buildings and monuments. It is noted that there are only 4 scheduled ancient monuments, located a distance of 3.7km southwest (Killacraw Cairn Dun), 2 of which are situated 3km across the West Loch Tarbert to Northwest (Cnoc Dubh Na Leitreach Cairns and the Dun a Choin Duibh) and 1.5km west (Eilean Araich Mhoir Dun) from the proposed site. There are a limited number of listed buildings in the 5km detailed study zone, with only 4 category C listed buildings found within the study area (Spion Kop Kennels, Gatenagrenach Farmhouse, Dunmore Estate and Dunmore House).

The natural and landscape assets have been identified within a detailed 5km study area which can be seen in the drawing no. NAT.LAN.01 (see Appendix 2). The nearby location (approx. 4.5km north) of Glen Ralloch To Baravalla Wood Site of Special Scientific Interest area (SSSI), and Tarbert Wood Special Area of Conservation (SAC) have been nominated as statutory natural designations. In addition, there are a further two SSSI and SAC sites, Ardpatrick and Dunmore Woods and Tarbert Woods (approx. 3.5km west).

On the Natural Assets Plan protected / core path networks have also been presented. Of particular note is the core path / route 78 that runs east of the proposed turbine site (running southeast from Skipness to Kinnecraig, northwest of the proposed site). The route 78 has been promoted as part of the National Cycle Network.

The nearest conurbation of Whitehouse is just less than 1km to the west of the proposed site. There are more sporadic sitings of farm buildings and cottages around the proposed site, with Table 1 below listing the nearest individual properties. The turbines are proposed to be sited in an open field at approx. grid co-ordinates 182664E, 661104N (centre of site) as shown by the block plan (Drwg. No. 01) in Appendix 1. This location has been chosen to provide the greatest separation distance between the following surrounding uninvolved dwellings while attempting to obtain a clean air flow from the prevailing south-westerly winds.

Table 1: Nearest Individual Properties (taken from noise report)

Dwelling name	Distance to nearest proposed turbine (m)	Eastings (m)	Northings (m)	Altitude (a.s.l. m)
SPION KOP	1043.8m	183758.0	660807.0	122.2
REDESDALE HOUSE	1212.8	183845.0	660540.0	110.1
LONILIA	1205.3	183813.0	660491.0	106.3
CRAIG'S VIEW	500.0	183089.0	661401.0	56.2
ERISKAY	354.2	182812.0	660695.0	90.6
TIGH NAN CNOC	330.0	182608.0	660740.0	77.6
(UNNAMED DWELLING)	352.9	182834.0	661419.0	47.8
TIGH NA CUILCE	442.2	182699.0	661594.0	29.7
ARIVORE LODGE	389.3	182346.0	660861.0	59.1
THE DORRAN	415.9	182453.0	660742.0	70.4
HOME FARM	534.8	182061.0	661075.0	37.0
GLENREASDELL HOUSE	522.0	182295.0	660734.0	62.4
ARIVORE COTTAGE	418.7	182498.0	660701.0	73.9
AN-CONCEAS	518.7	182488.0	661675.0	17.4
BLUEBELL COTTAGES	593.6	182453.0	661744.0	12.7
ALLT NA FEIDH	656.1	182327.0	661768.0	12.8
THE RHINNS	683.4	182305.0	661788.0	12.3

3.0 Planning Site

The planning site boundary includes the proposed location of the two turbines, blade overhangs and a notional 'link' between the turbines (suggested as a road/track width) encompassing all non-temporary works within one boundary. This area extends to 0.115Ha (or, more precisely, 1115sq.m). The proposed electrical switch-gear, meter, and fuse cabinet shall only extend in size to 2m x 1.3m x 0.5m and shall be situated in the vicinity of turbine 2 and within the 'red-line' planning boundary. This cabinet shall have a green coated aluminium finish and is detailed in drawing no. Details-2 in Appendix 1. This is the only supporting ancillary equipment that will be in view. The grid connection route on the plan at this stage has not been included. It is predicted that this cabled route shall be totally underground to the point of connection.

Also identified on the site / block plan and location plan 1 (01 and 02, respectively) is the proposed location of the temporary access to the site (for delivery and construction of the turbines only). This route uses the existing farm access track as much as is practical and it has been highlighted the portion which would deviate over the field in which the turbines are to be sited. It is projected that the access track area will return to farmland within a year of construction of the turbines and all land will be made good to the existing state. Quarterly maintenance access shall be via a 4x4 vehicle and/or on foot.

4.0 The Proposed Development

Needs and Benefits – a statement by the landowner

It is estimated that the Endurance E-3120 wind turbines at the Arivore Farm site will generate over 261,238 kWh/pa each which is equivalent to powering 118 homes per year (using average domestic consumption of 4423kWh/pa). Using RenewableUK's carbon dioxide emissions savings calculator it is estimated the wind turbine would save approx. 4530.80 tonnes of carbon dioxide over the life of the project.

In addition to the benefits to the environment the proposed renewable energy project will bring (see below for further details) it is proposed that the electricity generated by the proposed wind turbines shall be exported fully onto the grid, and that the farm shall benefit from the Feed-In-Tariff mechanism currently in place. We note the following statement from the landowner at Arivore Farm:-

“.....over the past few years it has been difficult to keep up with docking controls and with the extra money generated this will improve the overall quality of the land and for my livestock.”

“we have also lost two shed roofs due to the high winds over the past year and again, any money generated will go towards replacing the shed roofs - the main farm building is in need of repairs as well....”

Mrs M. Dewar, JUNE.2013

The Turbines

This proposal is for the erection and operation of “small” wind turbines, as classified by RenewableUK, the UK's largest renewable energy association and Argyll and Bute Council. The wind turbines will have a maximum hub height of up to 25m, a rotor diameter of 19.2m, with a maximum blade tip height, when the rotor blades are in a vertical position that will not exceed 34.6m. Full technical specifications are found p of this report and technical elevations and sections are to be found in appendix 1 (see drawing ‘Details 1’).

The model proposed is the Endurance E-3120 three bladed horizontal axis turbine. It is envisaged that the turbine's installed capacity will be in the range of 50kW. Its maximum dimensions will not be greater than those stated above. The predicted wind speed for the site taken from the Met Office National Climate Information Centre (NCIC) data is approx. 7.2m/s at 25m above ground level (AGL). This turbine maximises the electrical generation potential from this type of moderate wind-speed site, utilising electrically assisted start.

Access & Construction

The proposed location of the wind turbines will require no new access road or parking facility as access will be taken from the public highway over farm access roads and onto farm tracks upon privately owned agricultural land at Arivore Farm. The turbines would be delivered on a single, standard HGV vehicle with an insignificant temporary increase in traffic movements on the local road network. It is worth mentioning that the farm currently can accept deliveries from similarly sized vehicles, in its role as a working farm and it is not expected that any new road widening measures, turning circles, parking or new accesses will be required for this development.

The concrete turbine foundations would measure approximately 6.0m x 6.0m x 1.4m (depth) and would be installed within a 2/3 day period using a small tracked excavator. The foundation will be backfilled so that only approximately 3m x 3m x 0.30m (height) would be visible above ground.

The wind turbines would be erected on site approximately three weeks after the pouring of the foundations, taking a further 1 to 2 days, dependant on weather conditions. A 50 tonne crane would be used to lift the tower sections, nacelle and blades into place. Once *in situ* the turbine will require servicing on a quarterly basis by an engineer who would access the site in a 4x4 car or small van and as such there will be no significant impact on the current road use, access or volume of traffic.

All refuse materials will be cleared on an on-going basis during construction and all relevant SHE requirements will be adhered to. It will be ensured that any pollutants will be used and stored, adhering to modern best – practice guidelines and no foreign elements or pollutants shall be introduced into any watercourses nearby the site.

The proposed turbine site is not located within a flood risk area as designated by the Environment Agency and it is not anticipated that the development will have any impact on the existing onsite drainage. There is no intention to build upon (or construct temporary access tracks upon) or immediately adjacent to any watercourses. Please also note that there is no evidence of subterranean water courses in the vicinity of the turbines – there are no wells or springs within 1km of the proposed development.

Noise

The Endurance E3120 is one of the quietest machines available on the market and whilst it would emit a small amount of aerodynamic noise, this must be taken in context. The indicative maximum noise level of a wind farm at 350m (1150ft) is comparable to the sound of leaves rustling in a general breeze (in the region of 35-45 dB).

Turbine Specifications

Please see Appendix 3 for the site-specific noise report, in which it is confirmed that the noise levels that, will be found outside all neighbouring properties within an approximate 1km radius. This report has been carried out with the assistance of Garrad Hassan WindFarmer specialist wind turbine design software and is in accordance with ETSU-R-97 and all subsequent Institute of Acoustics (IoA) publications, communiqués and guidelines. We also include a copy of the Hayes McKenzie Noise testing document for the chosen turbine – confirming the values used in our noise report.

Source/Activity	Indicative noise level dB (A)
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Car at 40mph at 100m	55
Busy general office	60
Truck at 30mph at 100m	65
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

Endurance E-3120 55kW Specification:

Turbine	
Configuration	3 blades, horizontal axis, downwind
Rated power @ 11 m/s	55 kW
Applications	Direct Grid-Tie
Rotor speed	42 rpm
Cut-in wind speed	3.5 m/s (7.8 mph)
Cut-out wind speed	25 m/s (56 mph)
Survival wind speed	52 m/s (116 mph)
Design lifetime	30 years
Overall weight	3,990 kg (8,800 lbs)

Rotor	
Rotor diameter	19.2m (63 ft)
Swept area	290m ² (3120 ft ²)
Blade length	9m (29.53 ft)
Blade material	Fiberglass / Epoxy
Power regulation	Stall control (constant speed)



Brake & Safety Systems	
Main brake system	Rapid fail-safe dual mechanical brakes
Secondary safety	Pitch control system (for over speed regulation) using passive spring loaded mechanism (patent pending)
Automatic shut down triggered by	High wind speed Grid failure Over-speed All other fault conditions

Towers	
Types and heights	Free-standing monopole: 24m (82ft), others available including lattice tower structures
Maintenance Access	Safe climbing system Working space inside the nacelle Tower-top work platform

The standard life span of a wind turbine of this size is in the region of 20 years if regularly serviced and maintained. At the end of any consented operational period the turbine will be decommissioned, removed from the site and the ground reinstated in accordance with details to be agreed with the Local Planning Authority.

5.0 Planning History

The landowner at Arivore Farm has no previous wind energy planning application history; however the adjacent farm at Froach-Choille had submitted an application for a wind turbine as part of a joint application for a dwelling house, shed and formation of access road, however this was withdrawn from the joint application, reasons to which are unknown.

At the time of writing there was an application for 5 dwelling houses on land adjacent to Tigh Na Croit, Whitehouse which had been granted on 13 June 2013 (12/00753/PP). It should also be noted that the closest dwelling house is due to be located approximately 925m from the nearest proposed wind turbines at Arivore Farm. As shown in the noise report in Appendix 3, the proposed wind turbines will not cause any direct noise impact to the granted dwelling development.

Wind Development in the area

One consented wind turbine development has been identified within the detailed study area;

- 1 x 23.8m high wind turbine at Kilchamaig Farm, Whitehouse (12/00241/PP - 2.3km to the S.W.)

In addition to the consented site in the vicinity there is only one 'pending consideration' development, as detailed below:-

- 11 x 100m high wind turbines at Freasdail Wind Farm, North of Loch Cruinn (12/02150/PP) - 2.5km to the S.)

There is one 'refused - appeal in progress' development within the 5km search radius;

- 1 x 84m high wind turbine on land North of Redesdale House, Skipness. This application was originally refused as it had a direct landscape visual impact upon the North Arran National Scenic Area. It should be noted that due to location and size of the proposed wind turbines at Arivore Farm and the outcome of the ZTV, it is anticipated that there will be no visual impact within the North Arran National Scenic Area.

All of the above mentioned turbines are taken into account in our Cumulative assessment (described in more detail in the Landscape and Visual Impact Assessment in appendix 2).

6.0 Planning Policy and Guidance

Section 25 of the Town and Country Planning (Scotland) Act as modified states that *“Where, in making any determination under the planning Acts, regard is to be had to the development plan, the determination shall be made in accordance with the plan unless material considerations indicate otherwise”*.

Scottish Planning Policy (SPP) explains, at paragraph 25, that this means that *“Where a proposal is in accordance with the development plan, the principle of development should be taken as established and the process of assessment should not be used by the planning authority or key agencies to revisit that”*.

Material considerations should be related to the development and use of land and so spurious objections should not be given any weight. Material considerations can also include all Government and relevant local planning authority publications whether related to planning or not.

Of prime importance, and the second portion of the local development plan is comprised of the Argyll and Bute Local Plan 2009. Policy numbers LP REN 1 (A) and (B) and LP REN 2 deal with the criteria in which renewable energy applications are assessed. LP REN 1 deals with large wind farms and wind developments where an over-arching policy states that the council shall support the development of renewable energy schemes where they can be shown to be environmentally acceptable. LP REN 2 states that any *“development which undermines the quality of any internationally designated natural site (and where it cannot be confidently proven otherwise) shall not be approved by the council.”*

Policy LP REN 1 (A) states that the Council requires any renewable energy proposal to have a satisfactory influence on areas and interests of nature conservation significance including local biodiversity, ecology and the water environment, together with any impacts on the landscape and townscape character, scenic quality and visual and general amenity. Furthermore, Argyll and Bute Council shall resist any proposal for renewable energy that will affect local core paths, site of historic or archaeological interests, important tourist facilities and along any telecommunications, transmitting and receiving systems within the area.

Policy LP REN 1 (B) provides guidance on wind farm schemes that are over 20 megawatts in form of a Broad Areas of Search map. Applications within the Broad Areas of Search will generally be supported as long as the application can demonstrate that the proposed development will not have an unacceptable adverse effect on Special Protection Area, Special Areas of Conservation, and Ramsar sites and any other local designated areas.

Argyll and Bute Council do not provide alternative policies for smaller developments in regards to Broad Areas of Search, the proposed application at Arivore Farm has therefore taken into account the guidelines provided within Policy LP REN 1 (B).

Policy LP REN 2 states that the Council will support commercial and domestic wind turbines that can demonstrate that the technology can operate efficiently, the development is located close to the premise, that it will intend to serve and is safely and technically possible, as well as showing an acceptable servicing and access point to the proposed development. The application must also demonstrate that the proposed development will not have an unacceptable adverse impact on areas and interests of nature conservation (including local biodiversity, ecology and the water environment).

Policy LP REN 2 also states that all commercial and domestic wind turbine applications should take into account their impacts upon any highly valued landscapes including Gardens and Designed Landscapes, sites of historic or archaeological interest, settlement character including conservation areas and any telecommunications, transmitting or receiving equipment.

Again, of prime importance to wind turbine guidance is the Argyll and Bute Council Structure Plan. A set of renewable energy objectives which are appropriate to Argyll and Bute is outlined under the strategic policy STRAT RE 1 - Wind Farm / Wind Turbine Development.

STRAT RE 1 states that wind farm development is encouraged where it is consistent with the 'Nature Conservation and Development Control', 'Landscape and Development Control' and 'Historic Environmental and Development Control' strategic policies. Proposals have been requested to demonstrate there will not be an adverse effect on the local communities, the natural environment, landscape character and visual amenity, any historical designations and telecommunications, transmitting or receiving systems.

STRAT 1 also states that the Council will identify, with appropriate justification in the Local Plan, Broad Areas of Search, as highlighted earlier in policy LP REN 1 (B) or, where appropriate, specific sites where wind energy development may be permitted. The Council will also indicate sensitive areas or sites which it is judged that for overriding environmental reasons, proposals for wind farm development would only be considered in exceptional circumstances in line with the criteria set out above. Issues associated with the cumulative impact of wind farm and wind turbine developments will be addressed within the application.

Scottish Planning Policy (SPP), Scottish Government, 2010 and the '2020 Routemap for Renewable Energy in Scotland' Scottish Government, 2011 have also influenced the development proposals. It is noted that these documents are again a material consideration in determining the planning application.

Cognisance of the 'Landscape Capacity Study on Wind Energy Development in Argyll and Bute' has also been taken.

7.0 Planning Issues and Justification

In this section we shall consider all the aspects, criteria and potential impacts of a renewable wind energy planning application as highlighted in the specific policies within the local and structure plan noted previously.

[Landscape and Visual Impact / Cumulative Effect](#)

Planning issues and justifications are detailed in the Landscape and Visual Impact Assessment with an executive summary within the document in Appendix 2 of the application pack for a complete description of the levels of impact predicted. However these aspects have been summarised and paraphrased in the following paragraphs.

The proposed wind turbine development at Arivore Farm is situated on sloping land on the Kintyre peninsula leading gently down to the West Loch Tarbert. Due to the nature of the sloping land, the majority of the theoretical views, out-with the immediate vicinity of the site, is located west/northwest partial over the West Loch Tarbert and on to the Knapdale peninsula, as shown on the 15km ZTV.01 in Appendix 2.

Due to the undulating nature of the localised landscape the theoretical visual impact is kept to the northeast and southwest of the development, however it should be noted that *'there are existing large scale woodland blocks coupled with other landscape resources and topography which provide degrees of screening and a sense of enclosure to broader landscape context, especially to the east, northeast, and southeast.'* (LVIA, Page iii)

The ZTV.01 show the theoretical visual impact from the proposed wind turbines will spread across a partial area of the West Loch Tarbert and across the coastal region of the Knapdale peninsula. Although the West Loch Tarbert will experience a degree of visual impact the Kintyre to Longranza, the ferry crossing is a transitory receptor and therefore any anticipated visual impact will be contained to a small proportion of its journey. As the ZTV.01 suggests, there will be a degree of theoretical visual impact to the coastal dwellings and a proportion of the Area of Panoramic Quality, however with the dense nature of the local forestry and the mature trees along the coastal road any impact from the proposed turbines will be deemed as being negligible.

There are small sections of the B8024 (national cycle route) where there are gaps in the mature tree lines that the wind turbines will be visible through, with non-restrictive views across the water towards the proposed development will be down at the water's edge. It should however be highlighted that there are no official stopping zones or any designated picnic areas along the main road that could be affected by possible visual impacts. Furthermore, the roadside ground coverage is uneven and unkempt with no safe passage down to the water's edge where the views of proposed wind turbines will be more prominent. Nevertheless, the combination of distance from the water's edge to the development and the size of the wind turbines, the visual impact can still be deemed as being low, as seen in Photomontage View 2 in Appendix 2.

Although the ZTV.01 plan shows that a small proportion of the wind turbines will be visible from the North Arran National Scenic Area, due to the large distances from the proposed site (15km) it is fair to conclude that any visual impacts on the area can be deemed as negligible.

The detailed 15km search radius investigations provided only one cumulative site which is the **'pending'** wind farm application at Freasdale. Whilst the proposed wind turbines at Freasdale are reported to be up 100m the 'cumulative' impact of both applications is limited due to the dense forestry situated around the proposed wind farm site. Nevertheless, *'it is accepted that views from the shore line and the open water are 'in combination', whilst 'sequential' views may be achieved*

from small stretches of the A83 and B8024 where gaps in the vegetation allow.' (LVIA, Page v); as shown with the CIS.ZTV02 within Appendix 2.

Whilst there are anticipated significant visual impacts within the close proximity of the proposed development and in particular to nearby individual dwellings, we feel that the application falls within the Local Plan Visual Impact Guidance. Reference should be made to Appendix 2 (LVIA and supporting information and photomontages), for a more thorough and detailed investigation and assessment on all of the above aspects of the visual impact of the proposed turbines.

Natural Heritage

The above issue is addressed in greater detail in our Landscape and Visual Impact Assessment which should be referenced in appendix 2 of the application pack where a complete description of the levels of landscape impact predicted to assets designated for their natural heritage has been undertaken. However, a summary of these aspects are addressed in the following paragraphs.

There are two designated Site of Special Scientific Interest and Special Areas of Conservation sites within the immediate 5km detailed study area for the development. Both the Ardpark and Dunmore Woods / Tarbert Woods and the Glen Ralloch To Baravalla Woods / Tarbert Woods SSSIs and SACs, as shown in the NAT.LAN.01 plan in Appendix 2, are located on the opposite side of the West Loch Tarbert and therefore will not have any direct impact from the proposed development at Arivore Farm. SNH's Site Management Statement confirms that neither stated SSSI/SAC have any ornithological or wildlife concerns within these areas as they are predominately feature a combination of upland and western acidic oak woodland and bryophyte and lichen assemblage. There are no further national nature designations within the 5km detail study area.

Two SPA records have been identified within the 20km search radius recommended in the SNH guidance ("Assessing the impact of small-scale wind energy proposals on the natural heritage – February 2012 v.2 12/12); Knapdale Lochs SPA (9.7km – 10.8km distant to the northwest of the proposed site) and the Kintyre Goose Roosts SPA (11km – 12km distant to the southwest of the proposed site).

From the table below it can be seen that the Black-throated diver bird species, found in the Knapdale Lochs SPA, is technically is in range of the 'Maximum Range of Qualifying Interest' as found in the above quoted document. However, it is the contention that the extreme distances between our modest development and the SPA almost fully mitigate the potential for impact (the SPA only falls within the qualifying interest radius by 300m over a 10km range). We accept that SNH will have to be consulted on the above; however it is considered that they will confirm the assertions.

Again, from the table below, it can be seen that the Greenland white-fronted goose, found in the Kintyre Goose Roosts SPA, is out with SNH's qualifying interest radius and therefore will not require any further investigations.

Special Protection Area name	Qualifying Interest	Maximum Range of Qualifying Interest	Is the application within the range of the qualifying interest?
Knapdale Lochs SPA	Black-throated diver	10km	YES
Kintyre Goose Roosts SPA	Greenland white-fronted goose	10km	NO

Detailed investigations showed that there are no locally designated nature / wildlife areas nor any Garden and Designed Landscapes within the 5km search radius.

Built Heritage / Archaeology

The above issue is addressed in great detail in the Landscape and Visual Impact Assessment.

There are 4 scheduled ancient monuments found within the 5km detailed study area, as presented in drawing no. HAP01-ZTV. One of the reported 4 scheduled ancient monuments (SAM), Kilocraw Cairn, is located out with the ZTV and therefore any potential impact on the site can be deemed as being negligible. The Eilean Araich Mhoir - Dun SAM situated approximately 1.5km to the northwest of the proposed site, is reported to see only 30% of the proposed turbines, however as the SAM is located on over grown / unkempt ground with no public access to the site it is fair to conclude that any potential impact on this site can be deemed as being negligible. The remaining two SAMs, Cnoc Dubh Na Leitreach Cairns and the Dun a Choin Duibh are located over 3km northwest of the proposed site across the West Loch Tarbert on the Knapdale peninsula. Although the ZTV shows both the SAMs having theoretical views of the proposed wind turbines the dense forestry that surrounds the sites will screen any potential views and therefore any anticipated impacts on the sites can also be deemed as negligible.

The importance of identifying Canmore sites in close proximity of the proposed development are recognised, which is why a detailed 1km radius study was undertaken in order to establish whether or not the historical sites will be effected during transit and/or construction.

As seen in HAP01-ZTV plan, there is only one Canmore site located within the 1km radius study area (Glenreasdale Lodge) and it is confirmed that there will be no direct impact on this site before, during or after construction of the proposed wind turbines.

Two further Canmore sites that are out with the 1km radius study area (Whitehouse Aerodrome Airfield and West Loch Tarbert Kennecraig Pier) have been identified, and it is recognised the importance of highlighting the fact that there will be no direct impact upon these sites.

The detailed historical investigation showed that *'there are a small number of historical features within the 5km study area and 2km detailed study area to the site boundary. Those features within the 5km study area include higher merited schedule ancient monuments, as mentioned above, and*

listed buildings, with the majority of the features deemed to have either no visibility or limited visibility screened by existing mature vegetation which would be seen within a wide landscape context. Within 2km radius of the site, all of the historic features while recognised are a lesser merit and while potentially having a degree of impact, the overall significance is deemed as low-negligible due to other mitigating factors, and that listed buildings and other features of note will not be under threat and that the development will 'preserve the buildings or its setting'. (LVIA, Page v)

Furthermore, if the Council feel obliged to instruct an archaeologist to be present during the construction stages of the project then the applicant will be more than happy to accommodate them.

Residential Amenity

It is recognised that there may be a potential for visual impact to a cluster of dwellings to the north of the proposed development and although they may have a high theoretical visual impact the dense woodland which is situated immediately south of the dwellings will screen any potential visual impacts and therefore will deem the turbine impacts as being negligible, please refer to Photomontage View 4 plan in support of this assertion.

The nearest settlement to the proposed development is Whitehouse which is located under 0.9km to the west. The settlement is '*predicted to have a negligible overall perceived impact and visibility towards the project, due primarily to the mature vegetation structure in the fore and middle grounds between the settlement and of the proposed site*' (LVIA, Page v), this becomes more evident within Photomontage View 5 plan. The viewpoint location was specifically selected at the highest vantage point of the settlement to show the worst case scenario, however it should be noted that several dwellings are located on the downward slope away from the main road and therefore will experience less visual impacts. Furthermore, it should be noted that the dwellings at Whitehouse all have westerly facing gardens and therefore will not be in direct view of the proposed development.

As highlighted earlier, the dwellings situated under 1km to the north of the proposed development were described as being negligible due to the woodland coverage, however there is one dwelling (Home Farm, 0.7km Southwest) that may have a perceived impact on their experiential characteristics although the visual impact is very low to negligible. It is recognised that there will be a degree of visual impact from these types of wind turbine developments, which is why careful examination of the local surroundings for the ideal location is undertaken, in order that the fewest number of dwellings will be affected.

Radar

Consultation with a radar/aviation specialist with indicative coordinates (worst case scenario) in consideration of this project was undertaken (report sheets are included in appendix 4). The only limited factor within the report is at Lowther Hill radar, however it is likely that there will be any objection as the line of sight occlusion occurs at blade tip heights less than 130m AGL with terrain

screening at Croc an t-Suidhe (188265E, 658215N). In the avoidance of doubt, we would like to draw attention to the airfield at Whitehouse as it is an historical airfield and is no longer in use or even exists.

Telecommunications

Consultation with the statutory bodies which assess potential impacts upon all telecommunication receivers /transmitters in the area was undertaken and whilst some consultations remain outstanding at the time of writing it is projected that there shall be no objections due to this aspect of the design. In support of this it is noted the lack of transmitters in the area in question, the relatively low level of the setting for the proposed turbines and the, comparably sized, mature tree screening extant in the area.

Should any reasonable request for post-construction impacts upon local TV reception be received, the developer would agree to all investigative and mitigation works (if necessary) to solve any issues found. As applicant it is therefore agreed to be bound by any planning condition re-affirming the above should approval be granted.

Recreation and Tourism

It is noted (upon our landscape asset plan - drawing no. NAT.LAN.01, see appendix 2) the various core, protected and proposed path networks that are extant within the 5km radius detailed study area. It is contended that these recreation assets will be largely unaffected by the development proposed – the vast majority of the paths benefit from the same high level density in surrounding forestry / plantations as the nearby surrounding dwellings.

It is accepted that the Core Path (KinneCraig to Skipness) and the National Cycle Route (National Route 78) that runs from the southeast to northwest passing the north / north-eastern side the proposed development will experience nearby views, however as the National Cycle Route is primarily used as an 'activity', any view of the turbines from cyclists will be short-lived. Furthermore, only a partial stretch of the Core Path / National Cycle Route will experience full visibility of the turbines as the nearby forestry plantation will provide adequate screening of the turbines.

As mentioned earlier in the report, views along the National Route 78 / B8024 along with eastern coastal region of the Knapdale peninsula are extremely limited due to the mature trees that are situated along the coastline. Therefore, any visual impact along route can be deemed as negligible. It is presented on the HAPZTV.01 plan that there is a walkway adjacent to the National Route 78. It can be said that any anticipated impacts along this route can again also be deemed as negligible due as a result of the screening provided by the mature coastline trees.

As the proposed wind turbines only require a standard HGV lorry for delivery, anticipated physical changes to the reported core paths and national cycle routes will not be required nor would any

road closures will be considered necessary. We therefore conclude that, any increase in traffic flow due to construction will be deemed as negligible.

8.0 Conclusion

It is noted that the conclusion of the consultant landscape architect in their assessment of the proposals:

"In my professional capacity, I would summarise that while a number of transitory receptors may see the development from open water and from the small stretches of classified roads in the vicinity, more importantly the residents of Whitehouse and the individual dwellings and farmsteads in the area will have no views of the turbines. However, it is acknowledged that some individual properties in closer proximity, while they may have limited views towards the turbines they may have a degree of impact on their experiential characteristics. Views are restricted due to larger ancillary buildings and / or trees in their sight line of the proposed turbines which effectively block their potential view. I would also summarise that there will be negligible impact on historical features of note and that any areas designated for their natural qualities will remain uncompromised post development."

It is the opinion that as the applicant, a proposal for a proportionally sized renewable energy development, has fully taken into account the potential for visual, and all other types of, impact upon local residents, users of local paths and roads, wildlife and local natural settings, settings of local historic importance and local commercial communications and safeguarding interests. It has also been recognised that this type of small development has a small, but important role to play in meeting renewable energy targets and providing a sustainable income to help support the viability of the business at Arivore Farm.

It is acknowledged that there is some limited visual impact at the nearest dwellings, indeed it would be impossible to remove these effects completely; nevertheless it is asserted that there are sufficient over-arching environmental, personal and financial benefits to counter-weight these issues. It is contended that the aforementioned proposals are in accordance with the material considerations of the local development plan and, therefore planning approval should be granted.

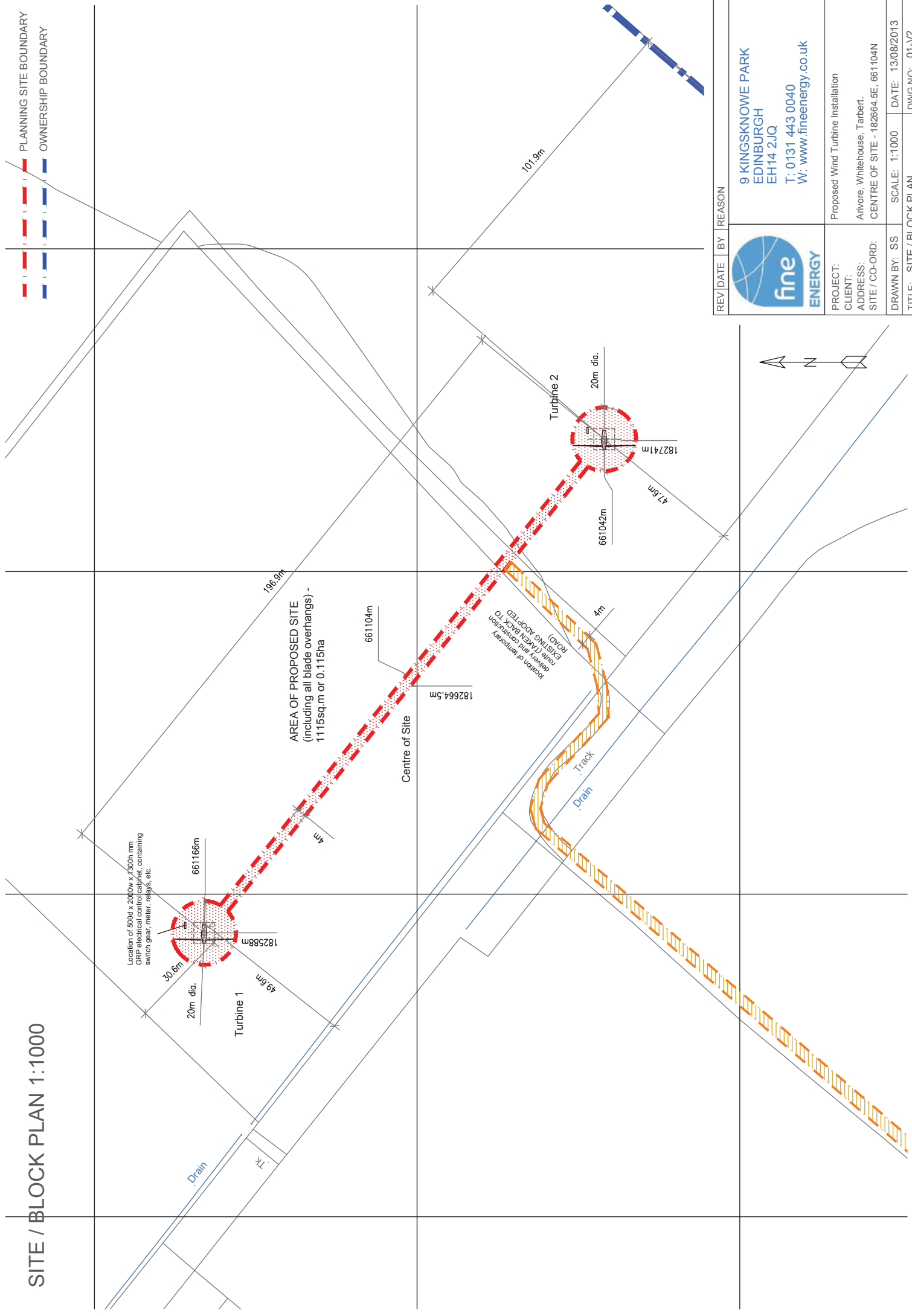


APPENDIX 1 : Supporting Planning Statement and SUPPORTING INFORMATION LIST

ARIVORE FARM planning application

Doc	Title	Drg. No	S / S	Rev
03	Site / Block Plan	01 – V2		
04	Site / Location Plan	02 – V2		
05	Location Plan 2	03		
06	Turbine Details / Elevation	Details 1		
07	Comparative Elevations	COM.ELEV 1		
08	Electrical Cabinet Details	Details 2		

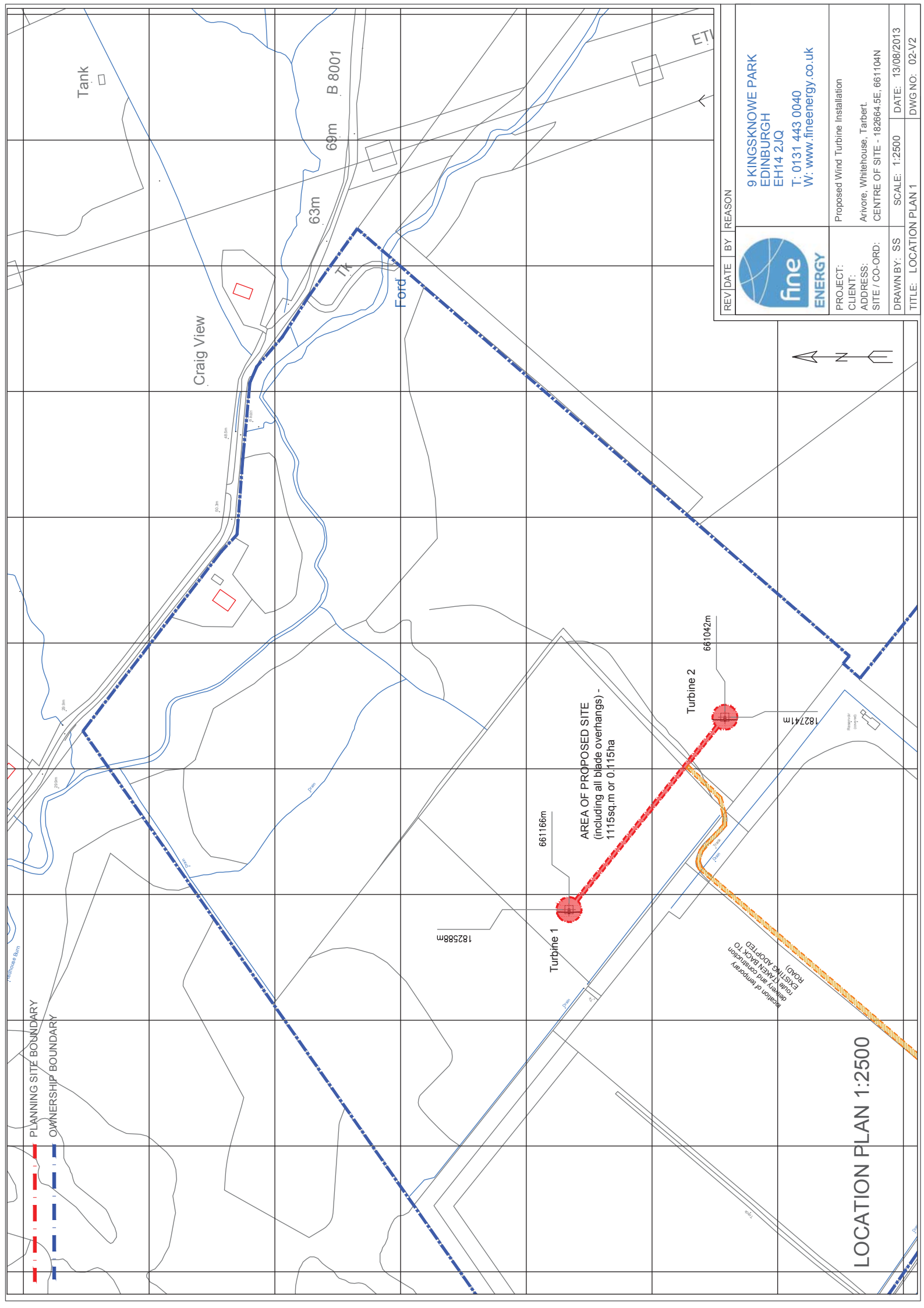
SITE / BLOCK PLAN 1:1000



PLANNING SITE BOUNDARY
OWNERSHIP BOUNDARY

REV	DATE	BY	REASON

	9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk
	Proposed Wind Turbine Installation CLIENT: Aivore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182664.5E, 661104N DRAWN BY: SS SCALE: 1:1000 DATE: 13/08/2013 TITLE: SITE / BLOCK PLAN DWG NO: 01-V2



PLANNING SITE BOUNDARY
OWNERSHIP BOUNDARY

Craig View

Ford

69m B 8001

63m

661166m

18258m

Turbine 1

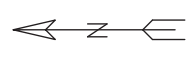
AREA OF PROPOSED SITE
(including all blade overhangs) -
1115sq.m or 0.115ha

Turbine 2

661042m

182741m

Section of temporary
roadway and associated
existing fence to
be removed



REV | DATE | BY | REASON



9 KINGSKNOWE PARK
EDINBURGH
EH14 2JQ

T: 0131 443 0040
W: www.fineenergy.co.uk

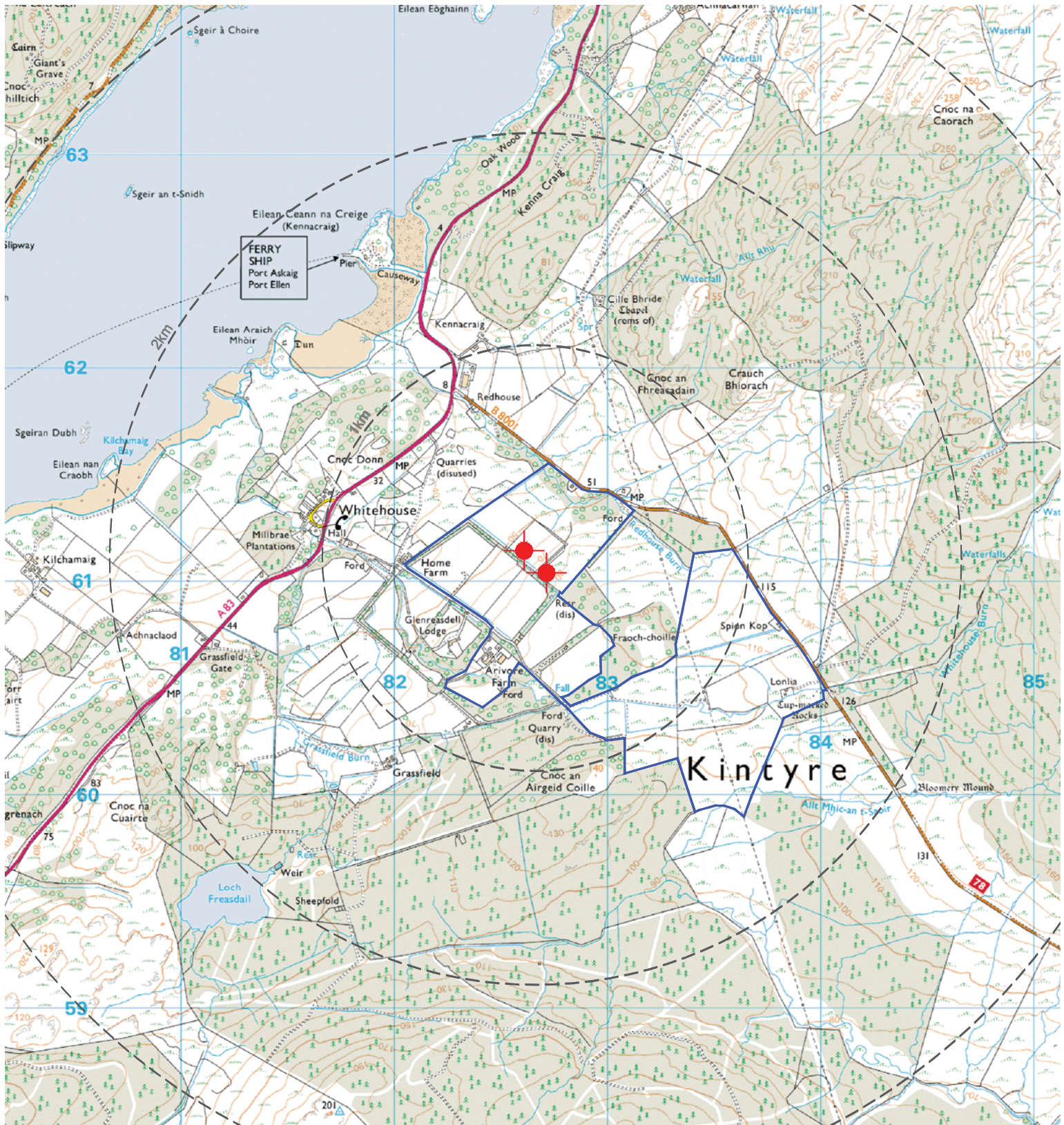
PROJECT:
CLIENT:
ADDRESS:
SITE / CO-ORD:

Proposed Wind Turbine Installation
Arivore, Whitehouse, Tarbert.
CENTRE OF SITE - 182664.5E, 661104N

DRAWN BY: SS SCALE: 1:2500 DATE: 13/08/2013
TITLE: LOCATION PLAN 1

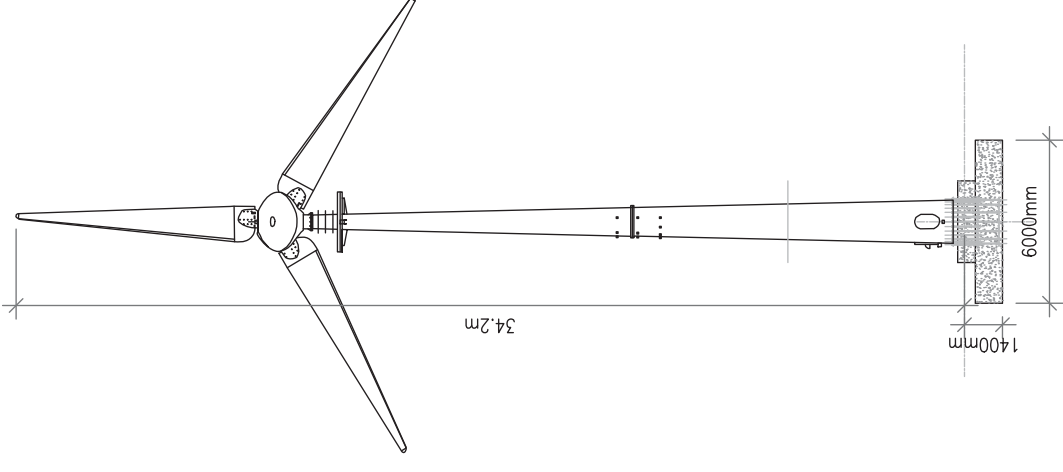
DWG NO: 02-V2

LOCATION PLAN 1:2500



LOCATION PLAN 1:25000

REV	DATE	BY	REASON
		<p>9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk</p>	
PROJECT:		Proposed Wind Turbine Installation	
CLIENT:		Arivore, Whitehouse, Tarbert.	
ADDRESS:		CENTRE OF SITE - 182664.5E, 661104N	
SITE / CO-ORD:			
DRAWN BY: SS		SCALE: 1:25000	DATE: 03/07/2013
TITLE: LOCATION PLAN 2		DWG NO: 03	

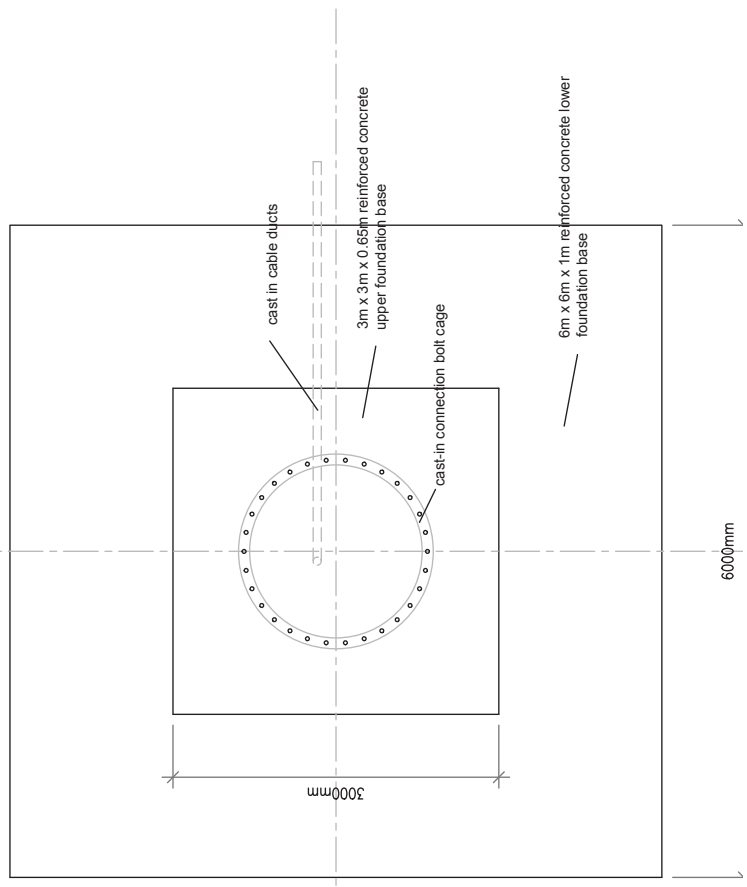
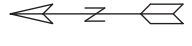


FOUNDATION / TURBINE ELEVATION 1:200

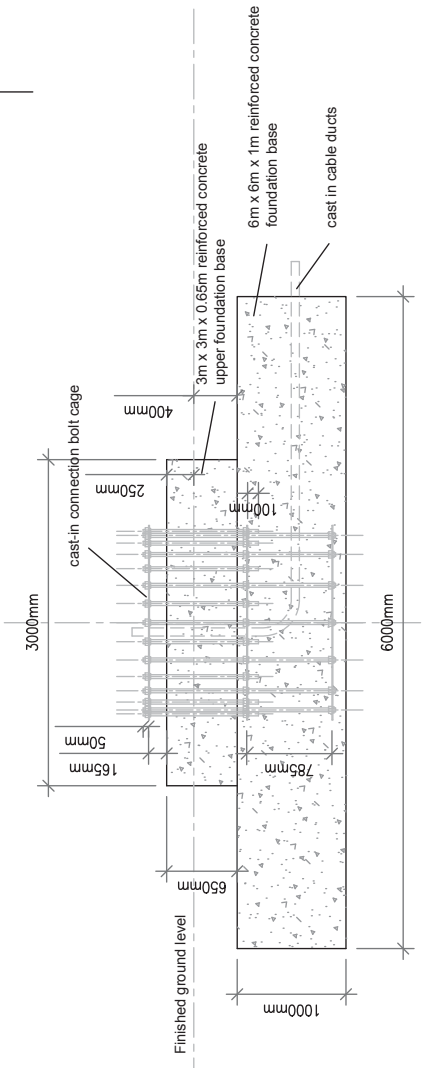
REV	DATE	BY	REASON



PROJECT:	Proposed Wind Turbine Installation
CLIENT:	Arvore, Whitehouse, Tarbert.
ADDRESS:	CENTRE OF SITE - 182664.5E, 661104N
SITE / CO-ORD:	
DRAWN BY:	SS
SCALE:	1:200/1:50
DATE:	03/07/2013
TITLE:	TURBINE DETAILS/ELEVATION
DWG NO:	DETAILS1



FOUNDATION PLAN 1:50



FOUNDATION SECTION 1:50

NOTE: TO BE READ IN CONJUNCTION WITH HUTCHISON ENGINEERING DRAWING: EWP60_24m-F_001 FOR FULL FOUNDATION / BOLT AND REINFORCEMENT DETAILS



9 KINGSKNOWE PARK
 EDINBURGH
 EH14 2JQ
 T: 0131 443 0040
 W: www.fineenergy.co.uk

PROJECT:	Proposed Wind Turbine Installation		
CLIENT:	Arivore, Whitehouse, Tarbert.		
ADDRESS:	CENTRE OF SITE - 182664.5E, 661104N		
SITE / CO-ORD:			
DRAWN BY:	SS		
SCALE:	N.T.S.		
DATE:	03/07/2013		
TITLE:	COMPARITIVE ELEVATIONS 1		
DWG NO:	COM.ELEV1		
REV	DATE	BY	REASON

Adult male - 1.8m

4x4 car - 2m

Tractor - 3m

Double Becker Bus - 5m

2-storey house - 8m

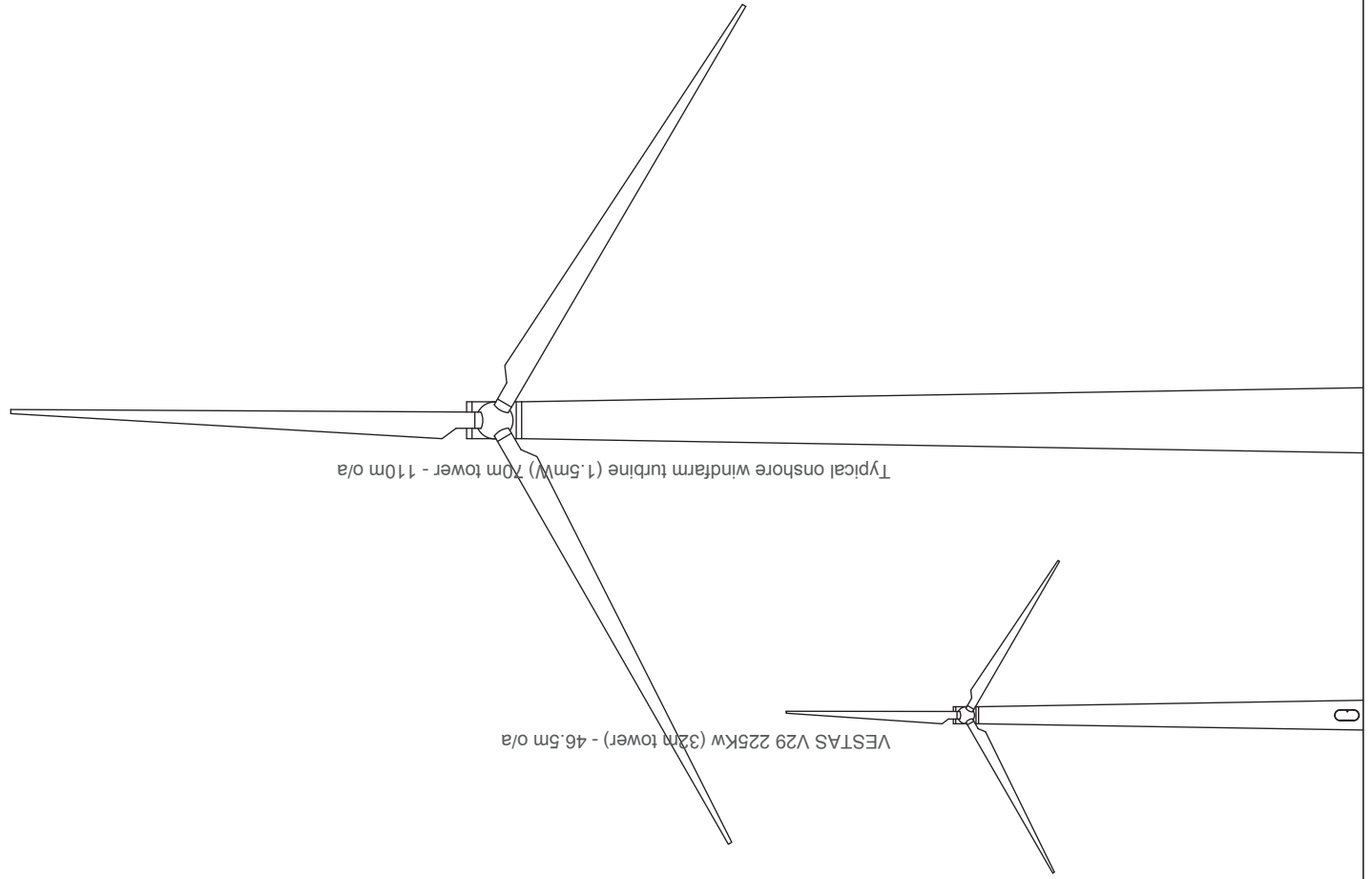
Communications mast - 25m

Evoco 10 (15m tower) - 19m o/a

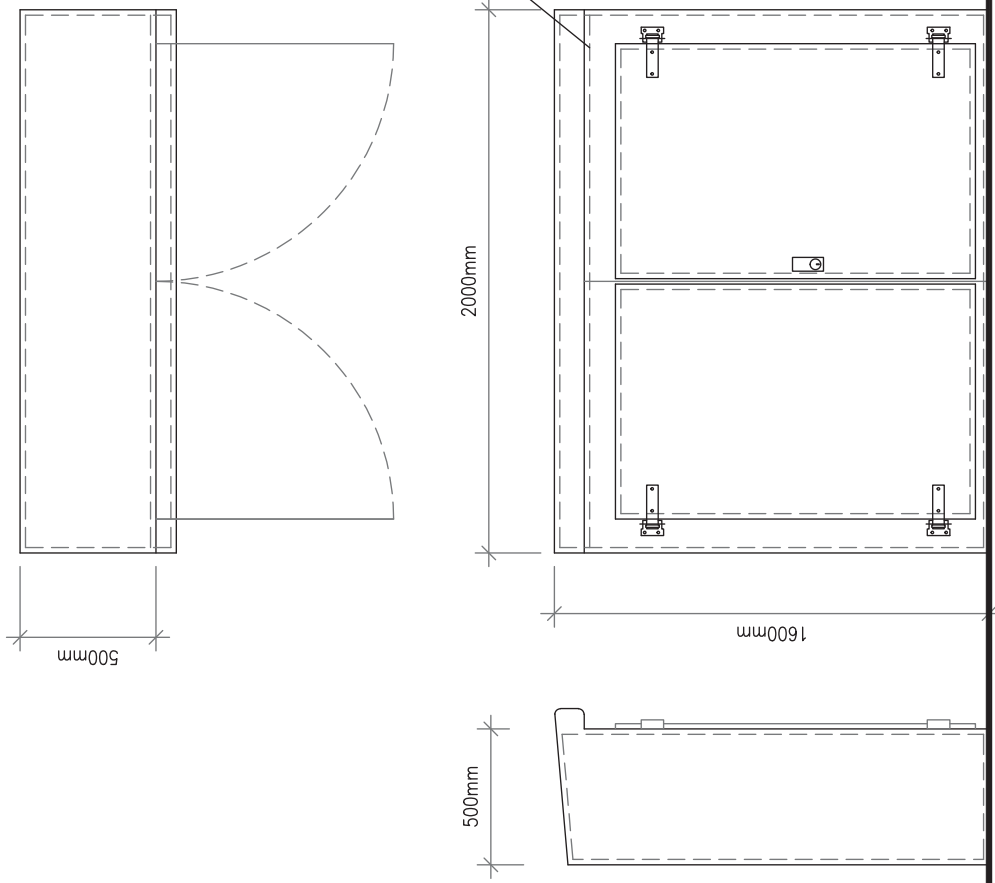
ENDURANCE E-3120 50kw (25m HUB) 35m TO TIP max.

VESTAS V29 225kw (32m tower) - 46.5m o/a

Typical onshore windfarm turbine (1.5mW) 70m tower - 110m o/a



COMPARITIVE TURBINE ELEVATION DRAWING (not to scale)



ELECTRICAL CABINET PLAN AND ELEVATIONS 1:20

REV | DATE | BY | REASON



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PROJECT:
CLIENT:
ADDRESS:
SITE / CO-ORD:

Proposed Wind Turbine Installation
Arvore, Whitehouse, Tarbert.
CENTRE OF SITE - 182664.5E, 661104N

DRAWN BY: SS

SCALE: 1:20

DATE: 03/07/2013

TITLE: ELECTRICAL CABINET DETAILS

DWG NO: DETAILS-2

APPENDIX 2 : Cumulative Landscape and Visual Impact Assessment and SUPPORTING INFORMATION LIST

ARIVORE FARM planning application

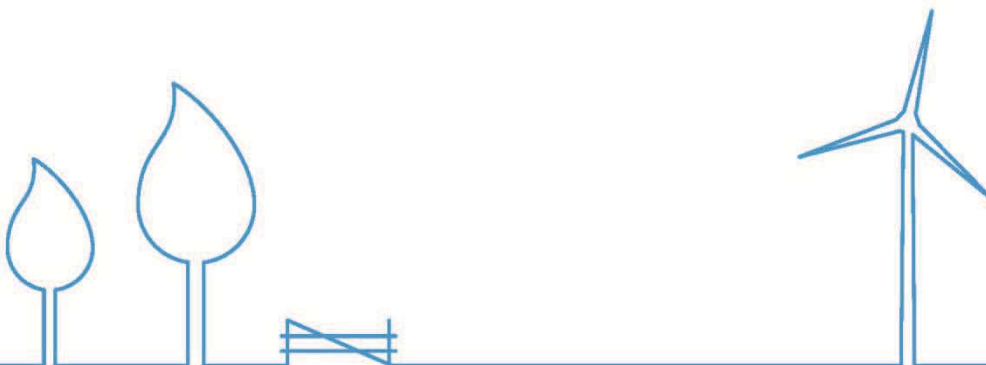
Doc	Title	Drg. No	S / S	Rev
10	Arivore Farm Cumulative Landscape and Visual Impact Assessment August 2013			
11	15km Zone of Theoretical View	ZTV.01		
12	Historic Asset Plan	HAP01-ZTV		
13	Landscape Character Area and Area of Search	NAT.LAN02		
14	Local Landscape Designation Plan	NAT.LAN01		
15	Natural Assets Plan	NAT.LAN03		
16	Cumulative ZTV Plan 1	CIS.ZTV01		
17	Cumulative ZTV Plan 2	CIS.ZTV02		
18	Photomontage View Plan with ZTV	PMV01-ZTV		
19	Photomontages & Wireframes 1 - 3	-		
20	Photomontages & Wireframes 4 - 7	-		
21	Photomontages & Wireframes 8 - 10	-		



FINE ENERGY LTD

Arivore Farm, Whitehouse, Tarbert, PA29 6XR

Cumulative Landscape & Visual Impact Assessment



Arivore Farm, Whitehouse, Tarbert, PA29 6XR

Cumulative Landscape and Visual Impact Assessment

August 2013



Local Planning Authority

Argyll and Bute Council

Site Centre Location:

182664E, 661104N

Author:

Lee Suzanne Houghton BSc(Hons), MLA

Handwritten signature of Lee Suzanne Houghton in black ink.

Checked by:

Stuart K. Scott BSc (Hons), MSc.

Handwritten signature of Stuart K. Scott in black ink.

Report Status: **FINAL**

Issue Date: **08 / 08 / 2013**

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August 2013

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EXECUTIVE SUMMARY

Site Location and Site Description

This Cumulative Landscape and Visual Impact Assessment has been carried out for Fine Energy in relation to a planning application for two turbines, type E-3120 Endurance, each up to 35m to blade tip and associated infrastructure at Arivore Farm, Whitehouse, Tarbert, PA29 6XR, site centred at 182664.5E, 661104N. The settlement of Whitehouse is just under 1 km to the south west. The classified roads A83, B8001 and B8024 are ~0.7km west, ~0.4km north and ~3km west respectively. The inland Loch Freasdale is less than 2 km to the south west.

In a broad sense and as described within the landscape character type 'Upland Forest Moor Mosaic' there are existing large scale woodland blocks coupled with other landscape resources and topography which provide degrees of screening and a sense of enclosure to the broader landscape context, especially to the east, north east and south east. The site, of approximately 0.09 hectares, within a land ownership totalling 133.7 hectares, lies over two fields given over to rough pasture. The land holding boundaries have varying degrees of delineation. To the north east and north west the boundaries the fields are defined by a low drystone wall. To the south east the immediate boundary is strongly defined by a mature broad leaf shelterbelt. To the south east of the second field boundary is the small woodland block Fraoch-choille (this is not within the land ownership). Further trees and scrub planting that runs along the Redhouse Burn watercourse adds further definition and a degree of enclosure to the immediate north of the land ownership boundary.

Visual Assessment

In general the proposed renewable energy development at Arivore Farm as deemed by the smooth undulating plateau with rounded ridges, craggy outcrops and irregular slope topography extends in a very narrow band to beyond 10km radius to the north west, albeit in very limited locations. A large percentage of the ZTV is contained within the 5km radius, with a high visibility radius within 1 km and then extending to within the 5km radius to the north west. Large blocks of woodland to the north, north east, east, south east and south west limit any views. The topography in the same directions also forms a series of high hills forming a ridgeline which extends in the middle length of the Kintyre peninsula. Broadly when viewing the site from the north west the turbines can be clearly seen, which reduces when moving towards the south west. Other than in very close proximity, views from other directions are minimal, and more often than not, there are no views afforded, primarily due to the prevailing topography and large blocks of mature woodland.

The site is on a broad level enclosed by high land to the north east, east and south east, which effectively enclose the site and curtails the ZTV in these directions. The prevailing landform provides a backcloth of rising agricultural land which also accommodates mature woodland plantation which the proposed turbines are viewed against when looking from directions where the views are more open. To the west and north west, where prevailing vegetation allows and where land elevations are lower the site is seen 'settled' into the hillside. It is recognised that in general from these directions the turbines are visible, although not to the structures in their entirety. It is considered that where clear views are seen, while the contrast in colour of the manmade structures against the natural hues is clearly

observable, at the same time the proposed development appears 'in keeping' with the agricultural landscape in which it is placed and is a natural addition to the farming business in which it is associated.

Visual Impact

Landscape

Sensitivity of the Landscape Character (based on existing components)

Scale : **Medium** - Upland plateau with rounded ridges, craggy outcrops and quite steep profile. Large blocks of coniferous plantation are mixed with winding narrow glens and small areas of open moorland. Mature tree lines are associated with rural roads and the limited number of sporadic buildings. A broad sense of enclosure and in some locations this extends to localised areas of intimacy. This contrast with more open areas associated with upland moors where there is no forestry and wide open water bodies in valleys.

Quality : **Medium** - Within the study area there is a small number of designated landscapes, partially within the ZTV, which includes a nature conservation site, SSSI and Area of Panoramic Quality.

Features of Cultural Heritage : **Low** - Contains a number of cultural features, most of which are lower in merit within 2 km of the site. High merited listed buildings and SAM's are within the 5km radius with a small number deemed within the ZTV, although the distances involved and the screening vegetation that exists between the features and the site arguably reduces the impact.

Level of Intrusion : **High** - There is little in the way of intrusion that exists in the landscape context to the site, other than roads, which typically follow the shore line and a three phase 11kv electricity line.

As the local landscape character has been classified as being **low – medium sensitivity** due to the features within, including buildings of merit, archaeological features and existing landscape resources as well as the sense of enclosure or openness that one would feel in different locations. It is deemed that overall the proposed development will have a **low magnitude** on receptors (including transitory, visual and areas designated for their merit in terms of nature etc.) and therefore the overall significance of effect on the character of the landscape and those using and within the landscape context is **negligible**. It is considered that this overall effect is **increased to low** for those receptors in the north west and west, where clear views are afforded, which would naturally increase the perceived impact.

Transitory & Visual Receptors

The transitory network within the study area is limited. The small stretches of classified roads within the ZTV have further reduced views toward the site, primarily due to the existing vegetation. The 'worst affected' transitory receptor would be those using the ferry routes, as open views are afforded from the West Loch Tarbert water body and the small sections of the A83 and B8024 (national cycle route) where there are gaps in the mature tree lines, to the north west of the site. Although not supported by a photomontage it is also considered that

those walking on the hills to the north east of the site before the path enters the woodland would have clear uninterrupted views of the turbines, especially when travelling south down the hill towards the B8001.

The project is located ~ 0.9 km from the nearest settlement Whitehouse which is predicted to have a **negligible overall perceived impact and visibility** towards the project, due primarily to the mature vegetation structure in the fore and middle grounds between the settlement and proposed site. There are a number of individual dwellings and farmsteads that are within 1 km of the proposed site with the majority having no or limited views of the proposed development, although it is recognised that there may be a perceived impact on other experiential characteristics. Many of the closest individual dwellings will have no visibility of the turbines and a small number may afford glimpsed views of part of the development, primarily due to the screening effect of prevailing vegetation.

Scottish Natural Heritage / Landscape Designations

It is considered that the majority of the classified SSSI and SAC sites will bear no detrimental impact from the proposed development and that the qualities and features for which they were designated will remain unchanged post construction. There are limited stretches along the edge of the designation that may have views towards the development and in this regard there is a small degree of visual impact but overall *“the development will not compromise the conservation objectives and overall integrity of the site.”*

Historical Features

It is recognised that there are a small number of historical features within the 5 km study area and 2 km detailed study area to the site boundary. Those features within the 5 km study area include higher merited scheduled ancient monuments and listed buildings, with the majority of the features deemed to have either no visibility or limited visibility screened by existing mature vegetation which would be seen within a wide landscape context. Within 2 km radius of the site, all of the historic features while recognised are of a lesser merit and while potentially having a degree of impact, the overall significance is deemed as low – negligible due to other mitigating factors and that listed buildings and other features of note will not be under threat and that the development will *“preserve the buildings or its setting.”*

Cumulative Assessment

In general views of the Freasdail Site which is pending in the planning system is the only cumulative site which may have a perceived detrimental impact on views from the north west and west looking towards the proposed site at Arivore Farm. It is accepted that limited views from the shore line and the open water are **‘in combination’**, whilst **‘sequential’** views may be achieved from small stretches of the A83 and B8024 where gaps in the vegetation allow.

Conclusion

From the above assessments of visual effects it has been found that the Arivore Farm two ‘small scale’ wind turbine proposal may have a medium - high visual impact on nearby views due to the number of residential, i.e. primary receptors that would experience these views, as

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Cumulative Landscape and Visual Impact Assessment

August 2013

well as transitory receptors using primary transitory routes and unclassified roads that are in close proximity. Other main roads within the 5 km study area, while affording views are only from limited locations and benefit from a degree of mitigation. However, as a renewable energy development, up to a maximum height of 34 metres, sitting within a broad open plateau with varying degrees of vegetation structure which in parts is degraded the development would have an uncomplicated relationship with the surrounding landform. On balance, then, the visual impact on the study area is considered to be of **low - medium significance in the local context** and **negligible** in the wider context.

In my professional capacity, I would summarise that while a number of transitory receptors may see the development from open water and from small stretches of classified roads in the vicinity, more importantly the residents of Whitehouse and the individual dwellings and farmsteads in the area will have no view of the turbines. However, it is acknowledged that some individual properties in closer proximity while they may have limited views towards the turbines they may have a degree of impact on their experiential characteristics. Views are restricted due to larger ancillary buildings and / or trees in their sight line of the proposed turbines which effectively block their potential view.

I would also surmise that there will be negligible impact on historical features of note and that any areas designated for their natural qualities will remain uncompromised post development.

It is considered that the agricultural landscape within the 'sensitive countryside' is ever changing and as such renewable energy developments have become part of the agricultural framework as a means for farmers to supplement and make their farming business successful and economically viable. In this regard the 'temporary' development should be seen as part of today's agricultural landscape and it is considered does not detrimentally affect the countryside or other designated landscapes to an extent that the development should be granted permission."

Lee James Hayton

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CUMULATIVE LANDSCAPE AND VISUAL IMPACT ASSESSMENT

1.0 Introduction

- 1.1 A Cumulative Landscape and Visual Impact Assessment (CLVIA), has been undertaken for this project in line with the screening and consultation process with Argyll and Bute Council. This section reports on the potential landscape and visual effects of the proposed Arivore Farm application, which will comprise of two wind turbines, type E-3120 Endurance, each up to 35m to blade tip, and associated infrastructure at Arivore Farm, Whitehouse, Tarbert, PA29 6XR, site centred at 182664E, 661104N.
- 1.2 The aims of the assessment process are to promote the best 'environmental fit' for the development through consideration of the existing landscape resource, the potential landscape and visual effects, design alternatives and any mitigation that might be possible. The assessment process refers to landscape value and, in particular, landscape designations and related planning policy, as well as landscape character and capacity for wind turbine development at this site.
- 1.3 This Cumulative Landscape and Visual Impact Assessment has been carried out for Fine Energy in relation to a planning application for two turbines at Arivore Farm, the settlement of Whitehouse is just under 1 km to the south west. The classified roads A83, B8001 and B8024 are ~0.7km west, ~0.4km north and ~3km west respectively. Loch Freasdail is just under 2 km to the south west.
- 1.4 The approach to this appraisal has been to consider the impacts on the physical structure and aesthetic character of the landscape and, the impacts on the visual amenity of those experiencing views of the site.

Policy Summary

- 1.5 In the Planning Supporting Statement a summary of the planning policy directly related to Renewable Energy for the area is provided.
- 1.6 General Landscape and Natural Heritage issues are broadly specified within Scottish Planning Policies (February 2010) and states that *'planning authorities should take a broader approach to landscape and natural heritage'* while the landscape in *'both the countryside and urban areas is constantly changing and the aim is to facilitate change'* while different landscapes will have *'a different capacity to accommodate new development.'*
- 1.7 The site as identified in the Argyll and Bute Local Plan (ABLP), adopted 6th August 2009 falls within land classified as 'sensitive countryside'. It does not fall within any other designations, although it is recognized that other designations and a small number of cultural features fall within the study area and ZTV. As stated in P/DCZ5 *"the capacity of sensitive countryside to successfully absorb development is limited...medium to large scale development (not housing) may also be permitted subject to being consistent with all other policies"*. The site although within sensitive countryside is right on the edge of land identified as a Rural Opportunity Area. Policy LP BUS 2 also has been identified as one which the proposed development would require conformity in that b)*"proposals for small scale development in the sensitive countryside"* would have to demonstrate a specific location within the countryside zone.

- 1.8 Policies LP ENV1 and LP ENV2 consider the impact that a proposed development may have on the general environment or on biodiversity. The proposed renewable energy development will take into account LP ENV1 a-j, and will assess that there will be no “*significant adverse impacts*” in relation to habitats and species of local importance. There is a Local Nature Conservation Site which is approximately 1.6 km to the west of the site, which covers the waterbody West Loch Tarbert. In this regard steps will be taken to “*avoid, mitigate or compensate*” for any perceived impact, although it is realized that a degree of visual impact will occur and that the siting of the proposed turbines has been managed carefully within the landownership to minimize the visual impact while still being able to propose a viable scheme. It is considered that the two turbines during and post construction will not have a “*significant adverse effect*” and will accord to policy LP ENV8.
- 1.9 Within the 5 km study area and within the ZTV, it is acknowledged that there are sites of national and local importance in reference to sites within SNH site link, ABLP and Argyll and Bute Local Biodiversity Action Plan (ABLBAP), which have been identified on the Natural Assets Plan, Drawing No. NAT-LAN01. As mentioned in 1.x West Loch Tarbert is a local nature conservation site. There is also Ardpatrik and Dumore Woods SSSI (~4km south west), Glen Ralloch and Baravalla Woods SSSI (~4km north west) and Tarbert Woods SAC (~4km south west) which are all upland oak woodland and identified national sites and are covered under policy LP ENV5 of the ABLP. The proposed development will be shown to accord with LP ENV5 in that “*the proposed development will not compromise the conservation objectives and overall integrity of the site*”. It is considered that during and post construction the flora and fauna values for which the sites were designated will remain unchanged and that the visual impact on receptors using the sites for leisure pursuits will be minimal as views will be limited if at all afforded. In this regard the development will also conform to policy LP ENV6 ‘Development Impact on Habitat and Species’.
- 1.10 Within the study area there are a number of transitory routes, both for the vehicle (motor and cycle) and the pedestrian. Policy LP TRAN 1 sets out the criteria in which the development will be assessed with regards to public access and rights of way in that “*development proposals shall safeguard public rights of way, core paths and important public access routes.*” Argyll and Bute Council, in accordance with the LA Reform (Scotland) Act 2003, had to develop a core path plan which has currently not yet been adopted, with proposed core paths identified. A list of the routes is in table 2.1. It is recognised that along some stretches the proposed development will be viewed and may seem to contravene Policy LP TRAN 1, although in a large percentage of the route the turbines will not be seen by receptors using them.
- 1.11 As identified on The Historical Assets Plan, Drawing No. HAP01-ZTV, there are a number of cultural features within a 5 km and 2 km study area of the site, although the higher merited scheduled ancient monuments and higher graded listed buildings are not within the 2 km study area. Although recognised that some of the sites identified on the plan and which have been listed in Appendix A are within the ZTV it will be shown through assessment and photomontages that there will be no detrimental effect on the features or their settings and the proposed development will accord with policies LP ENV13 (a), LP ENV16 and LP ENV17 of the ABLP and that “*where development would affect a heritage asset or its setting...satisfactorily demonstrate that the impact of the development upon the asset has been assessed.*” (Appendix A and Section 4)

- 1.12 With regards to policy and strategy within the ABLP relating to renewable energy, policy LP REN 1 wind farm developments will be supported...where the technology can operate efficiently... *and where the development will not have an unacceptable adverse impact directly, indirectly or cumulatively*". This policy is detailed to a greater extent in the planning supporting statement.
- 1.13 As identified within the Argyll and Bute Landscape Wind Energy Capacity Study the proposed development falls under the 'small' typology in that it is between 20 – 35m and is a single or small group up to 5 turbines. However careful siting and other material considerations must be taken into account as paragraph 2.10 states that *"there is a 'noticeable threshold' at around 35m height to blade tip where over this height a turbine will quickly become a dominant feature in many lowland / more settled landscapes."* *"Some limited opportunities exist for the small to medium typology to be located on lower and gentler slopes at the transition with the 'Rocky Mosaic' where they could be back dropped by rising ground and visually associated with the more settled and farmed coastal fringes."* It is considered that through assessment and siting it will be shown that the two small scale turbines proposed at Arivore Farm will satisfy the policy requirements and will be the renewable opportunity that can be satisfactorily assimilated into its surroundings.

Assessment of Impact on Visual Amenity

- 1.14 The degree of visual impact varies with the position from which the site is viewed. In assessing the visual impact of the proposed development on the landscape, full consideration has been given to all viewpoints; their location and the distance from the site; the quality of each view; and, the impact that the development has on its setting. The visual assessment is based upon the supporting photomontage viewpoints and summarised in the table 1.1.
- 1.15 An outline viewpoint assessment has been conducted from particular viewpoints and visual receptors within the study area. The viewpoints were chosen based on the following criteria:
- Viewpoints should be representative of the likely impacts;
 - Viewpoints should show a range of different types of views;
 - Viewpoints should be representative of a range of different receptor groups;
 - If recognised to fall within the ZTV and to have visibility towards the site, viewpoints from areas and / or built forms which have cultural and / or landscape significance;
 - Viewpoints should be representative of a range of distances;
 - Viewpoints should be representative of the varying image of the wind project in the landscape.

Sensitivity, Magnitude and Significance

- 1.16 These three concepts are fundamental to an impact assessment. Sensitivity for landscape receptors may be shown by the distinctiveness of landscape character, inability to accommodate specific change without loss of landscape integrity and presence or absence of landscape designations. For visual receptors, different sensitivity factors apply, such as the character and quality of the existing views, the types of viewer affected and the general popularity or visual amenity of the area. Magnitude of change varies and relates back to sensitivity. Hence for landscape receptors, the degree of change to, or loss of distinctive landscape characteristics or features are considered. For visual receptors, the extent of visibility, numbers and types of affected viewers, degree of visual intrusion and distance of view are all relevant.
- 1.17 As with landscape impacts, the impact on visual amenity is a function of the *magnitude* of change and *sensitivity*. *Sensitivity* refers to viewer sensitivity and depends on the following:
- The length of viewing time e.g. a local resident with prolonged viewing opportunity will be more sensitive than a passer – by;
 - Context of view, e.g. a viewer with an existing view of industrial structures will be less sensitive than a viewer with rural views, and
 - Distance from the source.
- 1.18 The *magnitude* on the impact depends on the following:
- Obstruction or extent to which existing views are blocked;
 - Intrusion or the extent to which existing views are impinged upon;
 - Qualitative change to the landscape; and
 - Number of people / viewers who are affected.
- 1.19 Impacts are described according to their severity and are termed as either *high*, *medium* or *low*. A high impact on visual amenity would generally arise where an impact of high magnitude affects viewers of predicted high sensitivity.
- 1.20 There are a number of different types of visual receptors which are summarised as:
- **Primary Transitory** – those who travel along a main route or footpath / bridleway and have prolonged and clear or filtered views towards the site and / or are in close proximity;
 - **Secondary Transitory** – those using a less used route and who have either an open or filtered or limited views towards the site and / or may be in close proximity;
 - **Tertiary** – those travelling along a route that is a further distance from the site but have filtered views towards the site which is seen in the wider context or those in closer proximity who have no view but experience impact on experiential characteristics;
 - **Primary Visual** – have clear or filtered views to the whole or part of the turbine and / or of close proximity and / or will have an impact on experiential characteristics; and
 - **Secondary Visual** – have filtered views towards part or the whole of the turbine or no views towards the site but may have an impact on experiential characteristics.

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Table 1.1 Viewpoint Photomontage Locations (Refer to Photomontage Views Plan, Drawing No. PMV01-ZTV for Viewpoint Locations)

No.	Viewpoint	Receptors	Direction & Distance of view from the Site
1	Looking east from Dalmore House	Secondary Transitory, Secondary Visual	West / 3.6 km
2	Looking south east from Tigh Na Traich	Primary Transitory, Primary Visual	North West / 3.05 km
3	Looking south east from Port Askaig	Primary Transitory, Primary Visual	North West / 1.47 km
4	Looking south east from an unclassified road (national cycle route 78) adjacent to Bluebell Cottage	Tertiary	North West / 0.72 km
5	Looking east from Whitehouse	Secondary Transitory, Secondary Visual	West / 0.98 km
6	Looking east from near Home Farm	Primary Visual	South West / 0.453 km
7	Looking north east from Glenreadell Lodge	Tertiary	South West / 0.544 km
8	Looking east from A83	Secondary Transitory, Secondary Visual	West / 1.44 km
9	Looking north west from Spion Kop (Listed building)	Tertiary	South East / 1.28km
10	Looking north west from B8001	Tertiary	South East / 2.32 km

1.21 The following general criteria in the tables within the methodology have been used in the assessment of significance and magnitude of any direct or indirect impact on landscape components.

Defining the Study Area

- 1.22 The area of study corresponds broadly to the wider Zone of Theoretical View (ZTV – Drawing No. ZTV01) of the proposed development has been defined at 15km radius from the site centre. Indeed the majority of the ZTV is contained within a 5km radius, although primarily this is to the north west. There are small areas out with the 5km radius, again in the majority to the north west. These are areas of higher land or on the south east aspect of hills facing the site. Much of the deemed higher visibility zones out with 5km are contained within mature woodland, which would reduce any view afforded considerably. Within the 5 km radius views are afforded from the open water body of West Loch Tarbert and coastal fringes that sit at a low elevation. Much of the ZTV other than from the north west are areas which are in close proximity to the site. The site location benefits from large blocks of woodland coupled with high hills which effectively ‘wrap’ around the site and envelope the local context to the site. This is essentially the reason for the very contained nature of the ZTV.
- 1.23 The study area was further defined for each part of the assessment process as follows:
- Landscape and Visual Impact Assessment (LVIA)** – the study area was restricted to the application site, access routes, and the potential Zone of Theoretical Visibility (ZTV) from where there may be a view of the development at up to 5 km distance from the site centre.
- Cumulative Landscape and Visual Impact Assessment (CLVIA)** – there are two developments, one of which is granted the other pending (see paragraph 5.2) to be assessed cumulatively with the proposed development through photomontages and cumulative ZTV’s. The assessment has been accompanied by analysis of a computer model of the proposed wind turbine and existing landform (DTM) to produce ZTV graphics and photomontages of the proposed development. These graphics provide an indication of the proposed wind turbines as they would appear in the landscape once constructed.
- 1.24 The scope of the assessment has been established on the basis of consultation process and professional judgement and is summarised below.

Table 1.2 Scope of the Landscape and Visual Assessment

Landscape Issues	Description
Landscape Character	The effects of the proposed development on the landscape character and quality of the site area, as defined by the Argyll and Bute Landscape Wind Energy Capacity Study and the Argyll and Firth of Clyde Landscape Character Assessment and site survey.
Landscape Elements	Direct physical effects on landscape elements.
Visual Issues	Description
Local Community	Views from the local settlement edge of Whitehouse, individual dwellings particularly from sensitive receptors near the site, which lie within the ZTV.

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	Views from roads (A83,B8001) natural (edge of Loch West Tarbert) and cultural historic features (Spion Lop Listed Building) will also be taken into consideration.
Landscape Designations	Views from the ' sensitive countryside ' as illustrated in the Landscape and Natural Assets Plan and areas of notable importance (close to area of panoramic quality) as well as views from other areas of landscape character that have been designated for their qualities.
Major transport routes, Recreational Paths & Historical Features	Sequential views from important roads (national cycle route 78) and popular recreational routes including cycle and footpaths (core paths) where appropriate. Views taken from historical features and views towards the development that may include features or their settings (Glenreasdell Lodge – Canmore Site)
Cumulative Assessment	The cumulative assessment includes viewpoint assessment within the study area where simultaneous, in combination and / or successive views of more than one wind turbine may be achieved, and sequential cumulative assessment where more than one turbine may be viewed along transport routes, from features or from settlements (simultaneous or successive)

2.0 Existing Environment

2.1 This part of the LVIA refers to the existing landscape character, quality or condition and value of the landscape and landscape elements on the site and within the surrounding area, as well as general trends in the landscape change across the study area. A brief description of the existing land use of the area including reference to settlements, routes, vegetation cover, as well as landscape planning designations and local landmarks follow.

Site Location

2.2 The subject lands are located on the Mull of Kintyre peninsula, less than 2 km from the eastern edge of the West Loch Tarbert. The A83 is circa 0.7 km to the west and the B8001 is circa 0.4 km to the north. The small settlement of Whitehouse is circa 0.9km south west of the site. There are a small number of unclassified roads and access tracks that serve individual farmsteads and dwellings. The location of the site has been graphically presented on Location Plan 2, Drawing No. 03. Within the immediate local context to the site there are large blocks of plantation woodland and smaller woodland blocks as well as shelterbelt and tree lines associated with building groups, roads and field delineation. The land rises in a semi-circular arc to the east of the site and in particular the land is elevated in the north east to over 400m Above Ordnance Datum (AOD). The prevailing topography coupled with the large existing woodland has a large influence on the extent of the ZTV and the screening that is provided towards the proposed two turbines. A development of the proposed site presents the opportunity to release two wind turbines, each up to a height of up to 35 metres to blade tip, type E-3120 Endurance and associated infrastructure including concrete base and

foundations, sub-station and access track, which will provide energy using a method that is renewable and does not involve atmospheric carbon pollution. This accords with current policy and is considered positive and beneficial.

Land Use and Land Cover

- 2.3 The site, of approximately 0.09 ha, within a land ownership totalling 133.7 hectares, lies over two fields given over to rough pasture. The land holding boundaries have varying degrees of delineation. To the north east and north west the boundaries the fields are defined by a low drystone wall. To the south east the immediate boundary is strongly defined by a mature broad leaf shelterbelt. To the south east of the second field boundary is the small woodland block Fraoch-choille (this is not within the land ownership). Further trees and scrub planting that runs along the Redhouse Burn watercourse adds further definition and a degree of enclosure to the immediate north of the land ownership boundary. A three phase 11kv power line is to the north east and east of the subject lands.
- 2.4 The turbines site sits approximately at 58m – 73m Above Ordnance Datum (AOD). The land holding in which the site is situated has varying levels of metres AOD. The northern corner sits at ~34m AOD and rises to ~ 120m AOD on the eastern corner boundary. The southern corner of the land ownership is ~ 99m AOD, while the corner of the western boundary adjacent to Home Farm is ~ 38m AOD.
- 2.5 In a broad sense and as described within the landscape character area ‘Mull of Kintyre’ and landscape character type ‘**Upland Forest Moor Mosaic / Rocky Mosaic**’ (see below) there are existing large scale woodland blocks coupled with other landscape resources and topography provide degrees of screening, especially for receptors viewing from the north east, east, south east and south west.

Roads / Core Paths / Settlements / Dwellings

- 2.6 There are a small number of classified and unclassified roads, one which is also a national cycle route (B8024) within the study area. The ZTV is limited and as such only small stretches of the roads within the 5 km radius and only to the west, north west and north may have potential views towards the turbines.
- 2.7 As supported by the Natural Assets Plan, Drawing No. NAT.LAN01 there are a small number of core paths within the study area, and those within closer proximity to the site have been listed in Table 2.1. By the prolonged nature of a view that may be afforded by the receptor, i.e. those walking / cycling on the core path, the perceived impact is heightened. The core paths / cycle routes identified follow the route of existing roads identified.
- 2.8 Table 2.2 recognises that there are a number of primary and secondary visual receptors, residing in individual properties within 1 km radius of the site, which not only may have views towards the site but also may have effect on their experiential characteristics. This will be assessed in greater detail in section 4.0. The only settlement that is within the 5 km study area is Whitehouse, which is circa 0.9 km south west of the site. Views from the settlement are limited and in the majority screened by existing prevailing vegetation. (Photomontage 5)

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Table 2.1 Classified Roads / National Cycle Route / Core Paths within 5 km radius of the Arivore Farm two turbine proposal (~approximate distances taken from Google Earth)

Road Name	~ Distance to the Site from nearest part of the road / cycle route / path	Direction in relation to the site
A83	~ 0.7 km	West
B8001	~ 0.4 km	North
B8024 (National Cycle Route No. 78)	~ 3.0 km	West
Core Path		
C104 (b) Kennacraig to Skipness (B8001)	~ 0.4 km	North
C295 (c) Inverneil to Tarbert via Kilberry – Also NCN / B8024	~ 3.0 km	West

Table 2.2 Individual Dwellings / Farmsteads within approximately 1 km of the proposed Arivore Farm site (information taken from noise report which has been produced as part of the application submission)

Individual Dwelling / Farmstead	~ Distance to the site (in metres)	Direction From the Site
Spion Kop	1043.8	South East
Redesdale House	1212.8	South East
Lonlia	1205.3	South East
Craig's View	500.0	North East
Eriskay	354.2	South
Tigh Nan Cnoc	330.0	South
(Unnamed dwelling)	352.9	North
Tigh Na Cuilce	442.2	North

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Arivore Lodge	389.3	South West
The Dorran	415.9	South West
Home Farm	534.8	South
Glenreadell House	522.0	South West
Arivore Cottage	418.7	South West
An-Conceas	518.7	North West
Bluebell Cottage	593.6	North West
Allt Na Feidh	656.1	North West
The Rhinns	683.4	North West

Surrounding Landscape Character

- 2.9 To assist in the understanding and interpretation of this landholding and its wider setting, the appraisal draws on the findings of the Argyll & Bute Landscape Wind Energy Capacity Study, March 2012 which broadly reflects the Argyll and Firth of Clyde Landscape Character Assessment (No.78) prepared by Environmental Resources Management in 1996 for SNH. For the purposes of this CLVIA referral will be made to the Argyll and Firth of Clyde Landscape Character Assessment which classifies the land and its immediate setting as falling on the edge between the '**Upland Forest Moor Mosaic**' and '**Rocky Mosaic**', within the Mull of Kintyre.
- 2.10 The peninsula of Kintyre is a smooth undulating plateau, in places dropping quite dramatically to the sea. Most of the peninsula is a large scale mosaic of moorland and forestry plantation, although a small scale domestic character is evident in the lush glens on the eastern side. A broad lowland vale to the west of Campbelltown contrasts with the wilder, uninhabited uplands of Kintyre, although here an airfield has been built on the flat coastal plain behind the sand dunes. Prehistoric and celtic archaeology prevail and many sites and monuments remain along the edge of the upland areas. The moorland is generally uninhabited with communication routes following the coastal edge and cross over lowland areas..
- 2.11 The key characteristics of the landscape type 'Upland Forest Moor Mosaic are as follows:
- Upland plateau with rounded ridges, craggy outcrops and an irregular slope profile;
 - Upland lochs (within 5 km radius study area – Loch Freasdail, Loch Lurach, Loch Cruinn);
 - Winding narrow glens and wide river valleys;
 - Extreme large scale mosaic of forestry plantations and small areas of open moorland;
 - No or very limited field boundaries;
 - Very few buildings, occasional isolated dwellings on the edges of the moor; and

- Little access, roads typically follow the shorelines.

The key characteristics of the landscape type 'Rocky Mosaic' are as follows:

- Uneven, hummocky landform with rocky outcrops and narrow glens;
- Raised beaches, cliffs and distinctive rounded knolls;
- Rocky indented coastline with offshore islands and small sandy bays;
- Relatively small-scale landscape with diverse mix of colours and textures;
- Steep wooded cliffs and hummocky, gorse-covered slopes;
- Stone walls provide partial enclosure;
- Scattered isolated farm buildings and small villages in sheltered sites; and
- Archaeological sites.

- 2.12 The Argyll & Bute Landscape Wind Energy Landscape Capacity Study shows that the site is within a **medium - low** sensitivity area to medium typology wind energy development reflecting potentially increased scope to accommodate the smaller turbines of this typology to minimise impact on adjacent more sensitive settled coastal fringes and glens.

Historical Features

- 2.13 A number of historically recorded sites fall within the blade ZTV. With regards to assessing those features that would possibly be affected the most, the study area for Scottish sites and monuments and national monuments of recorded sites has been limited to 2 km of the site, or just outwith. Higher merited listed buildings and Scheduled Ancient Monuments have a study area of 5 km radius. The cultural heritage features are listed in Appendix A and represented in the Historic Assets Plan, Drawing No.HAP01-ZTV.

3.0 Landscape Resources & Mitigation

- 3.1 The proposed development will result in the loss of area of rough pasture land. However, when viewed in the wider context, rough pasture cover remains an abundant resource across the landscape. Once constructed the grazing resource can be reinstated and used as before up to the base of the turbines proposed.
- 3.2 Having defined the effect of the proposed wind turbines on the character of the landscape, consideration of the factors in the design and location can mitigate the potential impacts. The number of visual elements over the twenty year operational phase has been kept to a minimum. Furthermore, the location, size, style and appearance of the proposal has been designed and sited to minimise its impact on the landscape and visual amenity. This can be achieved by adopting the following mitigating measures:
- selecting the smallest design possible for the sub-station;
 - locating the sub-station as near as possible to the turbine to reduce the overall footprint;
 - use underground cabling as far as practical;
 - minimising the track length and width;
 - utilising an existing site access; and
 - connecting to the existing electricity line passing in close proximity to the north east of the site.

3.3 The land holding benefits from the fact that while it is screened in the immediate context by the mature woodland to the east and mature trees lining the unclassified road to the south, there is little landscape resource delineating the field boundaries that the turbines are located and in this regard there will be minimal loss of existing landscape structure. The access track is to be taken from the unclassified road to the south and to the western edge of the field to the south of the site. There may be a loss of roadside vegetation to facilitate this, but this will be compensated elsewhere within the land ownership. The mature trees along the road and the mature shelterbelt to the east of the field accommodating the track will provide screening. There are a number of individual dwellings and farmsteads in the local context which benefit from associated vegetation to their vicinities. In terms of mitigation, little is required in additional landscaping. However, the measure that would be provided would be:

- Re-instating any lost landscape resource with native based tree species through the construction (not including the entrance) along the length of the unclassified road that the track will be accessed from. Any existing landscape resource lost at the entrance will be replaced with compensatory planting elsewhere on the land holding.
- The reinstatement of a rough pasture grass mix similar to the one existing at present to the base of the concrete turbine bases and within the geotextile membrane used for the access track, which will allow the grass mix to grow through.

3.4 With the application of a reinstating strategy, it is considered that a renewable energy development proposal could be successfully assimilated into the existing landscape with as minimal landscape impacts as possible. Any existing landscape resource that is lost at the entrance or along the access track whilst constructing will be replaced with compensatory planting elsewhere within the land ownership or reinstated where lost, for example, along the unclassified road to the south or along the field boundary to the south of the site. This will strengthen the existing resource and the interface between the development and the transitory route in close proximity to the site.

4.0 Appraisal of Likely Landscape & Visual Effects

4.1 Landscape Effects are defined by the Landscape Institute as “*changes to landscape elements, characteristics, character, and qualities of the landscape as a result of development*”. The potential landscape effects, occurring during the construction and operation period, may therefore include, but are not restricted to, the following:

- Changes to landscape elements: the addition of new elements or the removal of trees, vegetation, and buildings and other characteristic elements of the landscape character type;
- Changes to landscape quality: degradation or erosion of landscape elements and patterns, particularly those that form characteristic elements of landscape character types;
- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities and the cumulative addition of new features, the magnitude of which is sufficient to alter the overall landscape character type of a particular area; and

- Cumulative landscape effects: where more than one wind turbine may lead to a potential landscape effect. Development may have a direct (physical) effect on the landscape as well as an indirect effect or effect perceived from out with the landscape character area.

Visual Impact Assessment

General Overall Visual Impact

- 4.2 In general the proposed renewable energy development at Arivore Farm as deemed by the smooth undulating plateau with rounded ridges, craggy outcrops and irregular slope topography extends in a very narrow band to beyond 10km radius to the north west, albeit in very limited locations. A large percentage of the ZTV is contained within the 5km radius, with high visibility radius within 1 km and then extending to within the 5km radius to the north west. Large blocks of woodland to the north, north east, east, south east and south west limit any views. The topography in the same directions also forms a series of high hills forming a ridgeline which extends in the middle length of the Kintyre peninsula. Broadly when viewing the site from the north west the turbines can be clearly seen, which reduces when moving towards the south west. Other than in very close proximity, views from other directions are minimal, and more often than not, there are no views afforded, primarily due to the prevailing topography and large blocks of mature woodland.

Visual Impact – West / South West

- 4.3 Long distance views from the west towards the site cannot be afforded when viewing from the transitory route B8024 (in the main) and from residential properties, where there is a large degree of existing vegetation that provides screening, as presented in Photomontage 1. The B8024 is winding, narrow and rural in nature, with passing places. Much of it is enclosed by trees and scrub vegetation as depicted in Photomontage 1, and as such there are no views of the turbines. It is acknowledged that from the shore line on the western edge of the West Loch Tarbert, with the mature tree line behind the visual receptor, clear views will be afforded, although there is no supporting photomontage evidence. It is therefore also assumed that there will be views from the edge of the Area of Panoramic Quality, although a large percentage of the designated site will afford no views.
- 4.4 The nearest settlement is Whitehouse, with Photomontage 5 depicting the view afforded from the settlement edge and the A83. The prevailing vegetation structure provides a strong framework and mitigates the view to the extent that only the top of the rotors are visible, albeit above the existing vegetation line and against open sky. When broadleaf trees are not in 'leaf' seasons the view may open up, but the majority of the development if viewed, will be seen against the coniferous plantation block. From the nearest settlement, it is considered that the impact from the proposed development is low – negligible.
- 4.5 Photomontage 6 depicts the view afforded in close proximity, on the edge of the land ownership boundary to the west south west of the site. Due to the distance clear views of the proposed development can be seen, although from that specific location, to only one of the turbines. Individual mature trees provide an element of screening. The development is seen against the back cloth or rising hills, although it does appear 'slightly out of scale' with the surrounding context, primarily due to the prevailing topography between the turbines and the

hills in the background. It is accepted that the magnitude of impact on those residing at Home Farm is high.

- 4.6 Further to the south west the views towards the site are screened by existing shelterbelts associated with the built form. Some locations will have no view of the development, as presented by Photomontage 7, taken from Glenreasdell Lodge. This primary building, in close proximity to the site benefits from mature vegetation in the grounds and also along the road from which it is accessed from. The viewpoint location is also at a similar elevation in metres AOD, which further aids the lack of view afforded.
- 4.7 The A83 is one of the main transitory routes within 1 km radius of the site and which potentially accommodates a higher number of visual transitory receptors. However between the route and the site there is a mature degree of screening which prevents views towards the site, as presented by Photomontage 8. The very tip of the rotor blade of one turbine is visible above the mature tree line and it is recognised that the view afforded may open up more when the trees are not in leaf. Based upon the supporting evidence it is considered that the impact from the proposed development on those using the A83 will be minimal when to the south of Whitehouse, primarily due to the existing prevailing vegetation structure along the roadside and between the site and the road. To the north of Whitehouse, views will begin to open up more.
- 4.8 There are a small number of historical features to the west and south west of the site, with not all identified within the ZTV (5km Historic Assets Plan, HAP01-ZTV). Those within the ZTV benefit from mature vegetation in the local context and the grounds surrounding the building or feature, as such that there are limited or no views towards the proposed turbines. In this regard it is considered that there will be no perceived impact on the feature or its setting and those council policies LP ENV13 (a), LP ENV16 and LP ENV17 are conformed to.
- 4.9 It is acknowledged that to the south west and west of the site there are a small number of sites designated for their natural value and that clear views from some locations from open water and the water shore edge will be afforded. The proposed turbines will be seen against a rising back cloth and existing woodland plantation, with the rotors not above the horizon lines from these viewpoint locations. It is recognised that there may be a perceived visual impact to and from the natural sites but the flora and fauna of note for which the sites were designated will remain uncompromised post construction and it is considered that the policies LP ENV2, LP ENV5, LP ENV6 and LP ENV8 are positively met.
- 4.10 From the south west and west, the attributes which contribute to the landscape make the sensitivity of that landscape medium. In some areas the prevailing topography and vegetation structure allow for a 'sense of enclosure' and intimacy with views remaining curtailed. Where a view is seen from the shoreline beyond the vegetation structure views become more open, although long distance views too far off horizons cannot be gained, so in this regard there is still a level of enclosure albeit quite wide. The nature of the landscape when viewed from these locations is tolerant to change with many of the existing views remaining unchanged post construction. Where the development is seen, it is seen in a context with interlayers of vegetation and local dips and rises which help to accommodate the turbines without them seeming disingenuous. The magnitude of impact on many of the receptors both transitory and visually is in the majority low to negligible due to the positive screening provided by the existing vegetation structure. This may slightly increase to medium, due to either the proximity

or the more open nature of the waterbody and associated shoreline. The overall significance of effect of the proposed development on those receptors to the south west and west therefore is deemed as low.

Visual Impact - South East & North East

- 4.11 As supported by the ZTV the degree of visibility from the south east and north east towards the proposed development is limited. This is primarily due to the extent of mature plantation woodland that exists in these directions. The ZTV extends slightly further to the north east but the woodland on the south west aspect of the rising hills will curtail any views within and beyond them. Other than the B8001 there are no other transitory routes to the north east and south east. It is recognised that there are walking trails up the hills and when in the open, views of the turbines will be seen, although this has not been supported by photographic evidence. Mature vegetation lining the B8001 on its southern side will also limit views that may be afforded by those using this route. This is supported by Photomontages 9 and 10.
- 4.12 Photomontage 9 has been taken from Spion Kop, which is a C listed building. While the building is at the lowest listed classification, none the less it has been identified and as such the view from this historical feature is screened by the existing mature coniferous plantation with no part of the proposed development being seen. Just south of the Photomontage 9 location is the start of a walking trail which goes to the north, through the woodland and to higher ground out with the ZTV. On higher slopes, before the woodland edge, it is considered that the turbines will be seen, but within a landscape context, rich with resource, which will endeavour to 'place' the development into its natural setting.
- 4.13 The degree of enclosure and subsequent screening towards the development through the existing prevailing topography and established vegetation structure is clearly represented by the photomontages taken from the south east. While the existing landscape resources increase the sensitivity of the landscape, it is the same resources that provide the screening benefit. There are no cultural features of higher merit that need to be taken into account. There is little in the way of discordant elements that are visible, although a three phase electricity line is within this immediate landscape context. The magnitude of impact is low as the entirety of the structure cannot be viewed and this will remain constant, other than on higher ground, where low numbers of walkers may see the proposed development. The overall significance of effect that the proposed development may perceivably have on those who travel and reside in the area is negligible; although it is recognised for a small stretch of walking trails the impact will be considerably higher when views open up toward the development.

Visual Impact – North West

- 4.14 The degree of visibility from the northwest is primarily dictated by topography and proximity, with a degree of screening available from existing mature trees that delineate field boundaries, classified and unclassified roads, as well as the presence of larger woodland blocks in the study area. Photomontage 2 (3.05km away), taken from the opposite road line (B8024) which follows the shoreline, depicts the clear view towards the proposed development. The middle distance view can see part of the development, as the lighter colour of the turbines contrast with the greens of the agricultural land and the darker hues of the coniferous plantations in the fore ground and back cloth to the development. The view of the

turbines show them settled within the landscape context, and do not appear out of scale or out of harmony with the agricultural setting in which they are placed.

- 4.15 Photomontage 3, taken 1.47 km north west on the causeway and adjacent to the pier of the ferry ship crossing (Port Askaig), depicts the view afforded. The view is clear and open of the two turbines and although part of the rotors are seen against open sky, the majority of the structures are against the back cloth of rising pastoral land and mature tree lines, which provide an established setting in which the turbines can be placed. As part of today's agricultural landscape the turbines do not appear inappropriate.
- 4.16 Although wireframe 4 depicts that clear views of the turbines would be afforded, in reality the mature tree lines that delineate the field boundaries and within the land holding of Bluebell Cottage mean that the development is effectively screened. It is acknowledged that in leafless seasons the views may open to a degree.
- 4.17 In general views from the north west vary dependant on the location and the prevailing vegetation structure. Views on low lying land where there is little in the way of mature trees and from open water are able to view the turbines clearly set against the rising pastoral agricultural landscape and with coniferous trees in the foreground and as a backdrop to the development. Locations at a slightly higher elevation and more inland where the vegetation is more abundant and mature in nature have limited views of the proposed development. The sensitivity of the existing landscape in terms of scale and existing features including landscape resources could be classified as being medium. Views from some locations are afforded, but they are of middle distance and are towards the development which is set within a partially enclosed context. From other locations the established tree lines provide a strong sense of enclosure with view heavily curtailed. The degree of impact varies from negligible to medium, while the overall significance of effect that the developer has on receptors is low – medium. It is recognised that from some middle distance views, the receptor will have a change to their outlook, although it is considered that the development has been sensitively sited.

Visual Impact Summary

- 4.18 The site is on a broad level enclosed by high land to the north east, east and south east, which effectively enclose the site and curtails the ZTV in these directions. The prevailing landform provides a backcloth of rising agricultural land which also accommodates mature woodland plantation which the proposed turbines are viewed against when looking from directions where the views are more open. To the west and north west, where prevailing vegetation allows and where land elevations are lower the site is seen 'settled' into the hillside. It is recognised that in general from these directions the turbines are visible, although not to the structures in their entirety. It is considered that where clear views are seen, while the contrast in colour of the manmade structures against the natural hues is clearly observable, at the same time the proposed development appears 'in keeping' with the agricultural landscape in which it is placed and is a natural addition to the farming business in which it is associated.

Visual Impact on the Landscape Character Area

- 4.19 The proposed development will add two turbines, each up to 35m to blade tip, to the open plateau as that form part of the 'Mull of Kintyre – **Upland Forest Moor Mosaic**' character type and unit.
- 4.20 Using the GLVIA criteria for evaluating sensitivity (Table M.1 in methodology) the following is deemed to apply to the local area surrounding Arivore Farm.

Table 4.1 Sensitivity of the Local Landscape Character

Landscape Element	Sensitivity Rating
<p>Scale: Upland plateau with rounded ridges, craggy outcrops and quite steep profile. Large blocks of coniferous plantation are mixed with winding narrow glens and small areas of open moorland. Mature tree lines are associated with rural roads and the limited number of sporadic buildings. A broad sense of enclosure and in some locations this extends to localised areas of intimacy. This contrast with more open areas associated with upland moors where there is no forestry and wide open water bodies in valleys.</p>	Medium
<p>Quality: Within the study area there is a small number of designated landscapes, partially within the ZTV, which includes a nature conservation site, SSSI and Area of Panoramic Quality.</p>	Medium
<p>Features of Cultural Heritage: Contains a number of cultural features, most of which are lower in merit within 2 km of the site. High merited listed buildings and SAM's are within the 5km radius with a small number deemed within the ZTV, although the distances involved and the screening vegetation that exists between the features and the site arguably reduces the impact.</p>	Low
<p>Level of Intrusion: There is little in the way of intrusion that exists in the landscape context to the site, other than roads, which typically follow the shore line and a three phase 11kv electricity line.</p>	Low
<p>Overall Landscape Sensitivity</p>	Low - Medium

4.21 The magnitude of effect on the local landscape character is assessed below using Table M.2 (in methodology) criteria.

Table 4.2 Magnitude of effect on Local Landscape Character

Landscape Property	Magnitude of Effect
<p>Change to Landscape Character: The established agricultural nature of the landscape context in which the two proposed turbines will be placed will invariably lead to a change, but from most directions and proximity this will be negligible due to the effective screening that exists. Where the turbines can be seen, they are seen within an established agricultural setting, do not appear out of scale and are seen in the majority against a rising back cloth with mitigating mature trees in the fore ground to the development. In this regard the landscape context easily 'absorbs' the proposed development.</p>	Low - Medium
<p>Change to Landscape Composition: While there may be some change locally, the overall effect on the landscape composition is less significant. In very close proximity, there is effective screening, with views only opening up at a middle distance and only from the north west.</p>	Low
<p>Change to Landscape Quality: The development may result in a small but discernible change to features / elements of the basic conditions when viewed from the north west and from the shore line and water body to the west of the site. Views from the Area of Panoramic Quality, other than on the shore line will remain unchanged due to the prevailing vegetation structure. View from historical features and their settings remain largely unchanged due to primarily large woodland blocks that effectively screen the development.</p>	Negligible - Low
<p>Overall Landscape Magnitude</p>	Low

4.22 As the local landscape character has been classified as being low – medium sensitivity due to the features within, including buildings of merit, archaeological features and existing landscape resources as well as the sense of enclosure or openness that one would feel in different locations. It is deemed that overall the proposed development will have a low magnitude on receptors (including transitory, visual, areas designated for their merit in terms

of nature etc) and therefore the overall significance of effect on the character of the landscape and those using and within the landscape context is negligible. It is considered that this overall effect is increased to low for those receptors in the north west and west, where clear views are afforded, which would naturally increase the perceived impact.

Roads / Core Paths

- 4.23 The transitory network within the study area is limited to three classified roads (also designated as core paths and national cycle route), as small number of access tracks to individual properties and walking routes into the higher lands to the north east, east and south east. The small stretches of classified roads within the ZTV have further reduced views toward the site, primarily due to the existing vegetation. The 'worst affected' transitory receptor would be those using the ferry routes, as open views are afforded from the West Loch Tarbert waterbody and the small sections of the A83 and B8024 where there are gaps in the mature tree lines, to the north west of the site. Although not supported by a photomontage it is also considered that those walking on the hills to the north east of the site before the path enters the woodland would have clear uninterrupted views of the turbines, especially when travelling south down the hill towards the B8001.
- 4.24 In general transitory routes out with the 5 km radius will have negligible impact from the proposed development. Those routes within 5 km and more so to the immediate west and north and small sections to the north west will have a deemed overall significance of *low* – medium, depending on the proximity. This is less acute to the north, west and east where the prevailing topography, vegetation structure and built form provide a degree of mitigation. However it is acknowledged that a higher sensitivity must be applied to the national cycle route where views are afforded (Photomontage 2), although the turbines would not be in direct sightline when travelling, but the viewer would have to be stationary or turn their heads to gain the view.

Settlement / Individual Dwellings

- 4.25 The appraisal of likely effects considers firstly landscape effects and secondly visual effects, in accordance with established best practice. The appraisal is informed by a number of supporting graphics, including a 15km Radius ZTV Plan, Drawing no. ZTV01. The ZTV provides an indication of the areas surrounding the site from which there may be visibility of the highest part of the wind turbine. This has been produced at a scale of 1:100,000 with the defined 15km study area, but takes no account of any built or natural feature which may mitigate views. It is perceived that any settlement and individual dwelling outside the 5km radius will have no impact. The only settlement within the study area which may have a perceived degree of impact is Whitehouse. However only a small portion of the structure can be seen as the prevailing vegetation structure effectively screens the majority of the development. In this regard the impact on the settlement of Whitehouse and those who reside there is negligible.

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Table 4.3 Dwellings within the study area ZTV where it is proposed that part or all of the turbine maybe visible (not taken into account existing mitigating factors such as vegetation etc. Distances taken from noise earth)

Individual Dwellings	Distance/ Direction	Overall significance of perceived impact
Spion Kop	1043.8 / SE	No Visibility - negligible
Redesdale House	1212.8 / SE	No Visibility - negligible
Lonlia	1205.3 / SE	No Visibility - negligible
Craig's View	500.0 / NE	No visibility as the woodland blocks to the immediate south of the property provides screening. - negligible
Eriskay	354.2 / S	There may be a small view and impact through gaps in the mature tree line although broadly screened – low - negligible
Tigh Nan Cnoc	330.0 / S	Visibility in the form of oblique views from the rear of the garden may be achieved – low - negligible
(Unnamed dwelling)	352.9 / N	No visibility as the woodland blocks to the immediate south of the property provides screening. - negligible
Tigh Na Cuilce	442.2 / N	Limited to no visibility as a mature tree line between the property and the site exists, a possible view in tree gap may be achieved – low - negligible
Arivore Lodge	389.3 / SW	May have limited views where gaps in the prevailing vegetation structure dictate, although would be from limited locations - low
The Dorran	415.9 / SW	May have limited views where gaps in the prevailing vegetation structure dictate, although would be from limited locations - low
Home Farm	534.8 / S	From the homestead the existing ancillary farm buildings and mature trees effectively screen the development. – low - negligible
Glenreasdell House	522.0 / SW	May have limited views where gaps in the prevailing vegetation structure dictate, although would be from limited locations - low
Arivore Cottage	418.7 / SW	May have limited views where gaps in the prevailing vegetation structure along the unclassified road are - low

An-Conceas	518.7 / NW	Limited to no visibility as a mature tree line between the property and the site exists, a possible view in tree gap may be achieved – low - negligible
Bluebell Cottage	593.6 / NW	Limited to no visibility as a mature tree line between the property and the site exists, a possible view in tree gap may be achieved from the rear of the garden – low - negligible
Allt Na Feidh	656.1 / NW	Limited to no visibility as a mature tree line between the property and the site exists, a possible view in tree gap may be achieved – low - negligible
The Rhinns	683.4 / NW	Limited to no visibility as a mature tree line between the property and the site exists, a possible view in tree gap may be achieved – low - negligible

4.26 The project is located ~ 0.9 km from the nearest settlement Whitehouse which is predicted to have a negligible overall perceived impact and visibility towards the project, due primarily to the mature vegetation structure in the fore and middle grounds between the settlement and proposed site. There are a number of individual dwellings and farmsteads that are within 1 km of the proposed site. Many of those listed in table 4.3 will have no visibility of the turbines and a small number may afford glimpsed views of part of the development, primarily due to the screening effect of prevailing vegetation.

Site Tracks and Sub-Station Building

4.27 In addition to the turbines there will be a small visual impact from the site tracks and the associated sub-station / control building. The small size of the building coupled to the likely location suggests that it is only likely to be visible from the small stretches of road, areas of open water and shore line and individual properties identified to the north west and west of the site. On this basis the significance of the effect would be negligible overall, with proposed landscape mitigation measures to be introduced to replace any lost landscape resource through construction.

Visual Impact on Landscape Designations, SNH and Historical Elements

Landscape Designations

4.28 The site sits within 'sensitive countryside'. Although it is stated that this designation has 'limited' capacity to absorb development, it is considered that the development can be positively introduced into the landscape context. This is due to a number of factors including the limited number of locations where the proposed development is seen. Routes and building groups including the nearby settlement of Whitehouse, which would potentially accommodate the largest number of receptors, in the majority also, cannot view the development. In this

regard many of the views and experiences within the sensitive countryside will remain unchanged. It is therefore deemed that the development will propose no significant or detrimental effect on the qualities of these areas or indeed have a negative effect on the experiential characteristics of those leisurely using these areas and will accord with policy LP ENV1 and specifically P / DCZ 5 of the ABLP. A large percentage of the Area of Panoramic Quality will remain unaffected as views towards the development are screened by prevailing vegetation. Where it is perceived that it may not conform to LP ENV10 where views are afforded from the edge of the designation, then the limited viewpoint locations are “*outweighed by the economic benefits*” of the proposed development.

- 4.29 There is a local nature conservation site which covers the open water body and it is acknowledged that open views towards the site from the west and north west will be achieved. While there is a visual impact there will be no detrimental impact on the species within and at the edge of the waterbody and therefore conform to LP ENV2 and LP ENV6 and those conditions will remain as per pre- construction.

SNH Designations

- 4.30 Within the 5 km study area there are the following SSSI's and SAC which in part are within the ZTV:
- Ardpatrik and Dunmore Woods SSSI – Upland Oak Woodland (756.69 ha - ~4km SW);
 - Tarbert Woods SAC – Western Acidic Oak Woodland (1595.97 ha - ~ 4km SW); and
 - Glen Ralloch & Baravalla Woods – Upland Oak Woodland (241.81 ha - ~ 4km NW)

As with the Area of Panoramic Quality, it is considered that the majority of the classified lands will bear no detrimental impact from the proposed development and that the qualities and features for which they were designated will remain unchanged post construction. There are limited stretched along the edge of the designation that may have views towards the development and in this regard there is a small degree of visual impact but overall “*the development will not compromise the conservation objectives and overall integrity of the site.*”

Historical Designations

- 4.31 It is recognised that there are a small number of historical features within the 5 km study area and 2 km detailed study area to the site boundary. Those features within the 5 km study area include higher merited scheduled ancient monuments and listed buildings, with the majority of the features deemed to have either no visibility or limited visibility screened by existing mature vegetation which would be seen within a wide landscape context. Within 2 km radius of the site, all of the historic features while recognised are of a lesser merit and while potentially having a degree of impact, the overall significance is deemed as low – negligible due to other mitigating factors. It is therefore concluded that the development is in accordance with policies LP ENV 13(a), LP ENV16 and LP ENV17, in that the protection of the listed buildings and other features of note will not be under threat and that the development will “*preserve the buildings or its setting.*”

- 4.32 All features recorded are presented in the Historic asset Plan, drawing No. HAP.ZTV 01. As presented in Appendix A – Cultural Features, there are a number of historical sites that lie in proximity to the site. Table A (Appendix) summarises the sensitivity, perceived potential magnitude of impact and overall significance of effect that the development may have on the listed features using the methodology described in the methodology section and associated matrix tables.
- 4.33 Broadly the overall assessments for sites designated under the National Monuments Records of Scotland and Scottish Sites and Monuments are negligible. There are a very small number of sites that have a low overall assessment, primarily due to proximity and being perceived as being within the visibility zone. Those within the ZTV but not within the landholding are situated within the surrounding landscape which has a field boundary and roadside vegetation structure, although in varying levels of degradation, as well as a number of shelterbelt and tree group / copse planting associated with individual buildings and field corners which will go towards screening and mitigating views to and from sites and the proposed turbines.
- 4.34 In the instances that the proposal would be visible from sites at a distance, it would be a relatively minor impact on the skyline and indeed, would be temporary given the 20 year operational lifetime of the scheme. Consequently the scheme will not detract from the appreciation or understanding of archaeological sites and monuments and other features of historical and cultural interest.
- 4.35 The proposed development would not significantly alter the character of the landscape. In fact the landscape can successfully absorb this new development without eroding its key characteristics.

5.0 Cumulative Assessment Impact

- 5.1 The cumulative impact has been assessed on known wind projects within a 15 km ZTV of the site (refer to Cumulative ZTV Plans). The plans were produced indicating where a simultaneous or successive visibility may theoretically occur between the Arivore Farm development and other projects (consented and in planning).
- Cumulative Impact with projects in planning and consented projects (Cumulative ZTV Plans 1 and 2, Drawing No's CIS.ZTV 01 – 02). The plans show areas where the Arivore Farm application site is in view only and where both the cumulative and proposed site at Arivore Farm can both be seen and where only the cumulative site is visible.
- 5.2 For the purpose of the cumulative assessment with other turbines sites being identified on the supporting photomontages the following projects are as listed:
- Kilchamaig, 1 x 23.8m, Granted; and
 - Freasdail, 11 x 100m, Pending.

Evaluation of cumulative landscape and visual effects

- 5.3 The level and significance of cumulative landscape and visual effects is determined in the same way as the main LVIA. The additional criteria required to evaluate cumulative effects relate to the certainty of effects of currently built projects, the likely effects of approved but not built projects, and the uncertain effects of known proposed projects currently within the planning system. With respect to the proposed development at Arivore Farm and the supporting photomontages 1 and 3, only sites that have either been granted and / or pending within the planning system have been identified.
- 5.4 Photomontage and Wireframe 1 show the granted cumulative 1 x 23.8m turbine. Wireframe 1 show both sites, although within a larger landscape context and in reality the existing prevailing structural vegetation provides mitigating screening whereby the cumulative site cannot be seen. The cumulative plan (CIS. ZTV01) demonstrates that the cumulative visibility zone is very similar for both sites, with a large percentage of the views afforded from the open body of water.
- 5.5 Photomontage and Wireframe 3 depict the view that could be afforded if the pending cumulative site was granted along with the proposed site at Arivore Farm. The two proposed sites are of different height but as the wireframe presents, the two sites sit at approximately the same elevation height above the horizon line, although it is accepted that there will be a level of visual impact with the different rotation of blades. While there are clear views towards the proposed site at Arivore Farm from Port Askaig, there is limited views towards the cumulative site, which reduces the perceived cumulative impact. As expected the ZTV is further reaching from the pending site at Freasdail and it is considered that the cumulative impact from both developments is limited. Where the proposed development at Arivore Farm can be seen from the north west the view seen is 'in combination' and from small stretches along the A83 and the ferry route it is considered that there may be 'sequential' views.
- 5.6 It should be acknowledged however, that like the ZTV, the cumulative ZTV's do not take into account mitigating factors such as built form and the existing prevailing landscape resource, which in some locations will prevent views towards both developments. The capacity to absorb cumulative elements is primarily due to the prevailing topography and landscape structure. These elements visually reduces any perceived cumulative impact that may occur between not only the proposed development at Arivore Farm with other intrusive features in the landscape, but also the proposed two 'small scale' height turbines with other turbines that have been granted and pending and of which were advised to include in the cumulative assessment.

6.0 Conclusions

- 6.1 In general the characteristics of the site and its immediate setting offer a positive opportunity to provide renewable energy for Arivore Farm within the 'Upland Forest Moor Mosaic / Rocky Mosaic' character area. Within 'sensitive countryside' there is limited areas that would be able to successfully absorb development, although it is considered that through assessment and photographic evidence that the proposed turbines appear 'settled and harmonious' in the landscape context in which they are sited. There are limited opportunities for development to be located on lower and gentler slopes where it could be backclothed by rising ground and

woodland that exists. The landscape capacity study identifies that the proposed development is classified as a 'small typology'. Although the proposal will in a change in the landscape character and experiential experience of the site and the surrounding context, it is considered that the impacts on the landscape character will be minimised and mitigated in a positive manner and, the limited loss of rough pasture land will have a negligible impact on the wider landscape resource. Any lost landscape resource through the construction of the proposed development will be reinstated, other than at the entrance, which will be compensated elsewhere on the field landholding in which the site is located.

- 6.2 In general the proposed renewable energy development at Arivore Farm as deemed by the ZTV is constrained. The majority of the higher visibility areas are within the 5km radius to the north west of the site, although there is a small 1-2 km radius that is deemed to have visibility. Existing topography in the form of high rising land to the north east, east and south east effectively enclose the broader context and curtail long distance views in this direction. This coupled with larger woodland blocks and mature trees line present further reduce the ZTV. It is acknowledged that middle distance views from the north west and west can be achieved. Views gained see the turbines against rising agricultural land with coniferous plantations in the fore and background, coupled with broadleaf tree lines. This helps to harmoniously accommodate the proposed development, without it appearing out of scale, in a landscape setting which recognisably has little in the way of existing discordant elements. Overall the landscape character was identified as having a low - medium sensitivity. The local landscape character and the receptors that live, travel and undergo leisurely pursuits are expected to have a perceived low overall magnitude of impact. It is considered the significance of the effect overall on the character of the landscape is negligible, although it should be recognised that visual receptors in the north west and west will have an increased low overall significance of effect, due to the lack of existing mitigating factors for example, screening structural vegetation, especially on views from the open water body, shore line and limited stretches of the A83 and B8024.
- 6.3 In general transitory routes out with the 5 km radius will have negligible impact from the proposed development. Those routes within 5 km and more so to the immediate west and north and small sections to the north west will have a deemed overall significance of *low* – medium, depending on the proximity. This is less acute to the north, west and east where the prevailing topography, vegetation structure and built form provide a degree of mitigation. However it is acknowledged that a higher sensitivity must be applied to the national cycle route where views are afforded.
- 6.4 The project is located ~ 0.9 km from the nearest settlement Whitehouse which is predicted to have a negligible overall perceived impact and visibility towards the project, due primarily to the mature vegetation structure in the fore and middle ground. Many individual dwellings within 1km radius will have no visibility of the turbines and a small number may afford glimpsed views of part of the development, primarily due to the screening effect of prevailing vegetation. There may be a perceived impact on the individual properties and farm steadings located close to the site. As such, careful consideration will be given to the scale, siting and form of the proposed elements within the development, for example, the footprint size, turbine design, colour and access. This coupled with further mitigation measures, such as applying a suitable grass mix to the base of the turbines after construction, will be used to ensure local impacts are minimised.

- 6.5 The site sits within land classified as 'sensitive countryside' with *"the capacity of sensitive countryside to successfully absorb development is limited...medium to large scale development (not housing) may also be permitted subject to being consistent with all other policies"*. The Argyll & Bute Landscape Wind Energy Landscape Capacity Study shows that the site is within a **medium - low** sensitivity area to medium typology wind energy development reflecting potentially increased scope to accommodate the smaller turbines of this typology to minimise impact on adjacent more sensitive settled coastal fringes and glens.
- 6.6 From the above assessments of visual effects it has been found that the Arivore Farm two 'small scale' wind turbine proposal may have a low – medium visual impact on views from the north west and west, with views from the middle distance more open than those in closer proximity. Transitory routes (including those classified as core paths and national cycle network) within the 5 km study area, while affording partial views are only from limited locations and benefit from a degree of mitigation. However, as a renewable energy development, up to a maximum height of 34 metres, sitting within rising agricultural landscape with varying degrees of vegetation structure, including large screening woodland blocks would have an uncomplicated relationship with the surrounding landform. Cumulatively there is little impact between the proposed site at Arivore and other identified cumulative sites due to the prevailing topography and existing mitigating vegetation structure. On balance, then, the visual impact on the study area is considered to be of low significance in the local context and negligible in the wider context.

METHODOLOGY

m.1 the methodology for the landscape and visual impact assessment (LVIA) and the Cumulative Landscape and Visual Assessment (CLVIA) has been undertaken in accordance with the methodology set out below and conforms with The Guidelines for Landscape and Visual Impact Assessment, Second Edition (Landscape Institute and IEMA, 2002). The following tables have been used to assess the existing landscape and its components and the subsequent assessment on the magnitude of impact and the overall significance of effect that the development may have on the landscape and its resources, both natural and built.

Landscape Sensitivity

m.2 Definitions of capacity that apply generally refer to the ability to accept a development without a 'significant' or 'unacceptable' level of change to the landscape. Implication of the criteria has to be identified and thresholds determined to give meaning to the words 'significant' and 'unacceptable'.

m.3 The sensitivity of the landscape is a measure of its inherent ability to accept change without significant or unacceptable effects on its character. This can be considered in two ways:

- an inherent part of the landscape characteristics, regardless of possible types or scales of change; or,
- in relation to a specific proposed type and scale of change.

m.4 In determining capacity, not only the sensitivity of the landscape to the particular type of development is considered but also the *landscape value* of the area concerned. Value may be determined in a number of ways, including by landscape designations (national, regional or local), cultural and historical associations and in terms of how it is valued by those who live in it or use it in some way.

m.5 The principals involved in determining impact significance is the same whether on single or multiple developments. This involves assessing:

- the sensitivity of the receptor to the type of change proposed; and,
- the magnitude of change that would result from the proposals.

Table M.1 Sensitivity of Existing Landscape Components

Sensitivity	Landscape Component	Definition
HIGH	Scale	Enclosed or small scale diverse landscape.
	Quality	Where the landscape is largely intact, coherent and balanced.
	Value	Valued landscape character with important components of a particular character that are susceptible to small changes, or is in good condition, valued and / or distinguishing features, and / or considered attractive and valued nationally and locally.

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	Cultural Heritage	Landscape contains category 'I*' listed buildings, scheduled ancient monuments, historic gardens and designed landscapes.
	Level of Intrusion	Landscape contains no or very few intrusive or discordant features.
MEDIUM	Scale	Fairly enclosed with an element of landscape structure, although in parts, may be in decline.
	Quality	Where the landscape is no longer intact and coherent and / or may have evidence of alteration, degradation or erosion.
	Value	Landscape of moderately valued characteristics, reasonably tolerant of change, area in good condition with some distinguishing or valued features and / or of local importance.
	Cultural Heritage	Landscape contains 'I' or 'II' category listed buildings and / or sites of regional / local importance.
	Level of Intrusion	Landscape contains a number of confusing, discordant or intrusive features.
LOW	Scale	Open and expansive with little landscape hierarchy and structure
	Quality	Where landscape is of low quality and may be degraded.
	Value	Landscape is relatively unimportant and not valued locally. The nature to potential change is tolerant. Weak landscape structure and few valued or distinguishing features, large scale intervention, i.e. tree felling, mineral extraction
	Cultural Heritage	Landscape contains archaeological sites of lesser importance and / or non-inventory gardens and designed landscapes.
	Level of Intrusion	Landscape contains many confusing, intrusive or discordant elements

Table M.2 Magnitude of Impact

Magnitude	Definition
HIGH	When the development may result in a major change which is easily discernible to key features / elements of the baseline conditions such that there is a noticeable change to the landscape.
MEDIUM	Where the development may result in a moderate but still discernible change, loss or alteration to one or more of the key features / elements of base conditions such that the underlying landscape is partially changed.
LOW	Where the development may result in a minor loss / alteration to some of the key features / elements of the basic condition. The landscape components would remain largely intact and similar to pre-development circumstances.
NEGLECTIBLE	Where the development may result in a very slight loss / alteration to the baseline conditions.

- m.6 The level of an effect is determined by a combination of sensitivity and magnitude of change which is demonstrated in the table M.3 below.
- m.7 Within SNH guidance table M.4 below demonstrates the height comparisons of common elements in the landscape and table M.5 provides a general guide to the effect which distance has a perception of the development in the open landscape.

Table M.3 Magnitude and Sensitivity Matrix for assessing overall effects

Magnitude	Sensitivity			
		High	Medium	Low
	High	High	Medium	Low
	Medium	Medium	Low	Negligible
Low/ Negligible	Low	Negligible	Negligible	

Table M.4 Height comparisons of common elements within the landscape

Landscape Element	Height in metres
Single storey house	5
1.5 – 2 storey house	6 - 10
Farmyard grain silo	10
Telegraph Pole	10.5
Mature Forest Trees	20
Pylon	30 - 35

Table M.5 General Perception of a wind turbine in an open landscape

Distance	Perception
Up to 2km	Likely to be a prominent feature
2 – 5km	Relatively prominent feature
5 – 15km	Only prominent in clear visibility – seen as part of the wider landscape
15 – 39km	Only seen in very clear visibility – a minor element in the landscape

Landscape and Visual Impact

- m.8 Landscape impacts and visual impacts are separate but related. Broadly *landscape impacts* are changes in the fabric, character and quality of the landscape as a result of development. Hence landscape impact assessment is concerned with:
- direct impacts upon specific landscape elements;
 - more subtle effects upon the overall pattern of elements that gives rise to landscape character and local distinctiveness; and,
 - impacts upon acknowledged special interests or values such as designated landscapes, conservation sites and cultural associations.

Visual Impacts are a subset of landscape impacts – they relate solely to changes in the appearance of the landscape and the effects of those changes on people. Hence visual impact assessment is concerned with:

- the direct impacts of a development upon the views of the landscape through intrusion or obstruction;
- the reaction of viewers who may be affected; and,
- the overall impact on visual amenity, which can range from degradation through to enhancement.

m.9 The February 2011 web-based renewable advice on ‘Onshore Wind Turbines’ replacing PAN 45 and Annex 2 dispenses with guidance on the effect which distance has on the perception of a windfarm by simply stating that “*In considering wind farm visibility it should be noted that in some locations and clear weather, turbines may be visible over long distances, though this will depend on elevation, the angle of the sun and other factors.*”

m.10 Turbines are prominent, large scale, man-made features and there are few precedents in terms of scale, height and appearance for modern turbines in a rural landscape. Topography aside, they are much taller than any natural features such as trees, most buildings and other structures. Of similar built structures in rural landscapes, electricity pylons are usually smaller. Furthermore, most landscape features are static whereas wind turbines rotate.

Cumulative Impact

m.11 Cumulative impact can be where one or more is visible from a particular location or where travellers encounter two or more in quick succession are of key concern (sequential impact). Although there may be specific visual impacts, it may be that development can be accommodated as a feature without altering significantly the intrinsic character of the landscape in question. The characteristics of wind turbines that lead to cumulative impacts include:

- the scale and striking visual appearance of wind turbines; and,
- the great extent of their visibility and the potential for inter-visibility between the developments and from receptors.

m.12 The cumulative effect can be expressed as follows, with assessment taking this into account:

- **‘In combination’** – 2 or more turbines are seen by the observer from the same viewpoint at the same time;
- **‘Successive’** - two or more turbines are seen by the same observer from the same viewpoint but only by turning to look in a different direction;
- **‘Sequential’** – two or more turbines seen by an observer whilst travelling along a route, when no more than one may be seen at the same time; and
- Repeated views of wind turbines can give travellers along a route the impression that they are travelling through a **‘wind farm landscape’**.

REFERENCES

An initial desktop study of Ordnance Survey (OS) maps, Scottish Natural Heritage, Past Map and planning documents followed by a site visit on the **28th May 2013**. The assessment and evaluation of the landscaping and visual features has been concluded alongside the prevailing planning policy guidance and policies and other supporting guidance in respect of these issues.

Information on landscape planning policy and the existing historical landscape elements has been collated by reference to the following:

References

- Royal Commission The Ancient and Historical Monuments of Scotland.
- <http://www.rcahms.gov.uk>
- Scottish Natural History, Site Link.
- <http://www.snh.gov.uk/sitelink/index.jsp>
- <http://www.pastmap.org.uk>
- Siting and Designing Windfarms in the Landscape, SNH, Dec 2009
- <http://www.snh.gov.uk/docs/A317537.pdf>
- Siting and Design of small scale wind turbines of between 15 – 50m in height, Scottish Natural Heritage, March 2012
- <http://www.snh.gov.uk/docs/A675503.pdf>
- Guidance: Cumulative effects of Windfarms, SNH Advisory Service, Version 2, 13/04/05
- <http://www.snh.gov.uk/docs/A305440.pdf>
- Guidelines on Landscape and Visual Impact Assessments (2nd edition), Landscape Institute of Environmental Management and Assessment, 2002
<http://www.landscapeinstitute.org/.pdf>
- Visual Assessment of Windfarms: Best Practice, University of Newcastle and Scottish Natural Heritage, Report NO. F01AA303A, 2002
<http://www.snh.gov.uk/docs/A305437.pdf>
- Argyll & Bute Local Plan, adopted 6th August 2009

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<http://www.argyll-bute.gov.uk/sites/default/files/planning-and-environment/written%20statement%202009.pdf>

- The Argyll and Bute Local Biodiversity Action Plan 2010 - 2015

<http://www.argyll-bute.gov.uk/sites/default/files/planning-and-environment/AandB%20BAP%20Draft.pdf>

- Environmental Resources Management 1996, Argyll and Firth of Clyde Landscape Character Assessment, SNH Review, No.78

<http://www.snh.org.uk/pdfs/publications/review/078.pdf>

- Argyll & Bute Landscape Wind Energy Capacity Study March 2012

<http://www.argyll-bute.gov.uk/sites/default/files/Argyll%20and%20Bute%20Landscape%20Wind%20Energy%20Capacity%20Study%20Part%20.pdf>

- Scottish Planning Policy 23, 2008, 'Planning and the Historic Environment'

<http://www.scotland.gov.uk/publications/2010/02/03132605.pdf>

- National Policy 2009 'Scottish Historic Environment Policy (SHEP)

<http://www.historic-scotland.gov.uk/shep>

- Scottish Government 2005 'Scottish Governments Strategic Environmental Assessment (SEA)

<http://www.scotland.gov.uk>environment>sustainabledevelopment>

- Historic Scotland 2010 'Managing Change in the Historic Environmental Setting.'

<http://www.historic-scotland.gov.uk/managing-change-consulation-setting.pdf>

- Royal Commission on the Ancient and Historical Monuments of Scotland

<http://www.rcahms.gov.uk>

- On Shore Wind Turbines February 2011

<http://www.scotland.gov.uk/Resource/0040/00405870.pdf>

- PAN 73 Rural Diversification

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

- PAN 60 Planning for Natural Heritage

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<http://www.scotland.gov.uk/Publications/2000/08/pan60-root/pan60>

APPENDIX A

Cultural Heritage - Shown on Historic Assets Plan, HAP01-ZTV

- SAM's within the 5 km radius AND within the ZTV
- Listed Buildings within the 5km radius AND within the ZTV
- Canmore Site

ARIVORE FARM – CULTURAL HERITAGE SCHEDULED ANCIENT MONUMENTS – within 5 km radius				
Name	Category	Sensitivity Rating	Magnitude Rating	Overall Assessment
Eilean araich mhoir dun 730m NWW of Tigh na Croft	Remains of a prehistoric dun	High	Negligible	Negligible
Killocrew Cairn	Burial Cairn (appears as a low grassy mound ~15m in diameter & 1.5m high)	High		
Cnoc dubh na Leitreach	2 prehistoric burial cairns	High		
Scheduled Ancient Monuments – The identified SAM sites are either out with the visibility zoe or have mature established vegetation including large mature tree belts that effectively screen the feature and the proposed development				
LISTED BUILDINGS – within 5 km radius				
Name	Category	Sensitivity Rating	Magnitude Rating	Overall Assessment
Spion Kop Kennels	C	Low	Negligible	Negligible
Glenreasdell Mains Claonaig	C	Low		
Gatenagrenach Farmhouse	C	Low		
Dunmore House	B	Medium		
Fraser Campbell of Dunmore Mausoleum	C	Low		
Listed Buildings - Those identified within the ZTV are situated within grounds which have mature vegetation as well as screening vegetation in the broader landscape context to the site,				

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including large coniferous plantation and broad leaf oak woodland. There could be a possible view from Dunmore House when trees are not in leaf, although it would still be considered that the detrimental impact would continue to be negligible.

SCOTTISH SITES & MONUMENT RECORDS - @ 2km radius of the site – all in ZTV

Name / Category	Sensitivity Rating	Magnitude Rating	Overall Assessment
West Loch Tarbert Kennacraig Pier	Medium	Medium / High	Medium / High
Unknown	Low	Negligible	Negligible
Cille Bhrìde Whitehouse	Low		
Eilean Araich Mhoir	Low		
Unknown Eilean Araich Mhoir West Loch Tarbert	Low		
Whitehouse Aerodrome	Medium		
Glenreasdell Lodge	Low		
Claonaig Water (x3)	Low		
Whitehouse Burn	Low		
Lonlia Farmstead	Low		
Glenreasdell Estate, Lonlia Spion Kop Kennels	Low		

Scottish Registered Sites – The large percentage of these sites will have a perceived negligible overall significance of effect on them as features from the proposed development. From Port Askaig Canmore Site (photomontage 3) the proposed turbines are clearly seen with the tip of the rotors above the horizon line. However the majority of the development is seen against agricultural rising land and appears ‘in keeping’ with its surrounding context. Mature coniferous woodland and broad leaf trees allow the turbines to appear settled.



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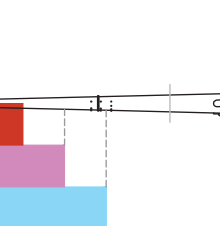
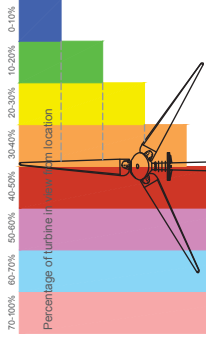
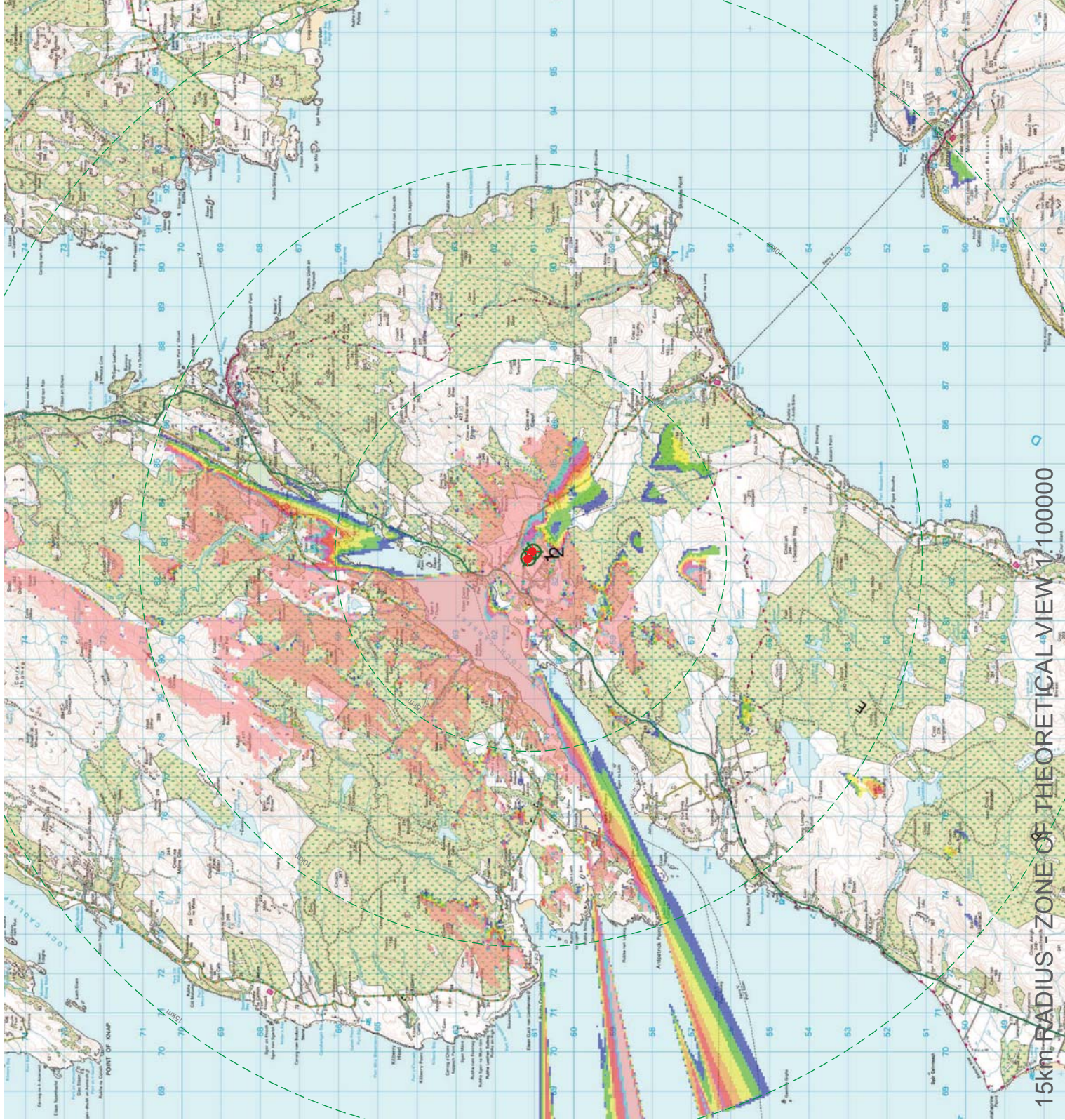
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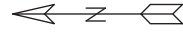
9 Kingsknowe Park
Edinburgh, EH14 2JQ
0131 443 0040

&


212 Zellig Building
The Custard Factory
Birmingham
B9 4AA
0121 449 4443



Zone of Theoretical View (ZTV) Colour Key

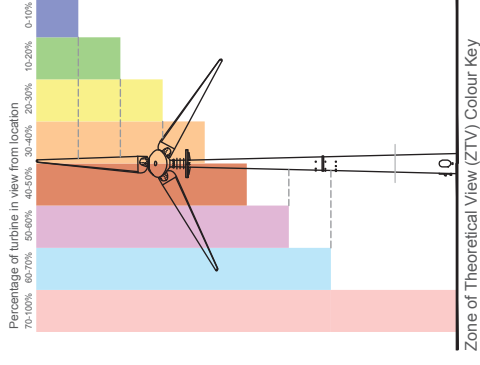


REV	DATE	BY	REASON

	9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk
PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tairbert. ADDRESS: CENTRE OF SITE - 182664.5E, 661104N SITE / CO-ORD:	SCALE: 1:100000 DATE: 03/07/2013 TITLE: 15km Zone of Theoretical View DWG NO: ZTV.01

15km RADIUS - ZONE OF THEORETICAL VIEW 1:100000

HISTORIC ASSETS PLAN (not to scale)



HISTORIC ASSET KEY



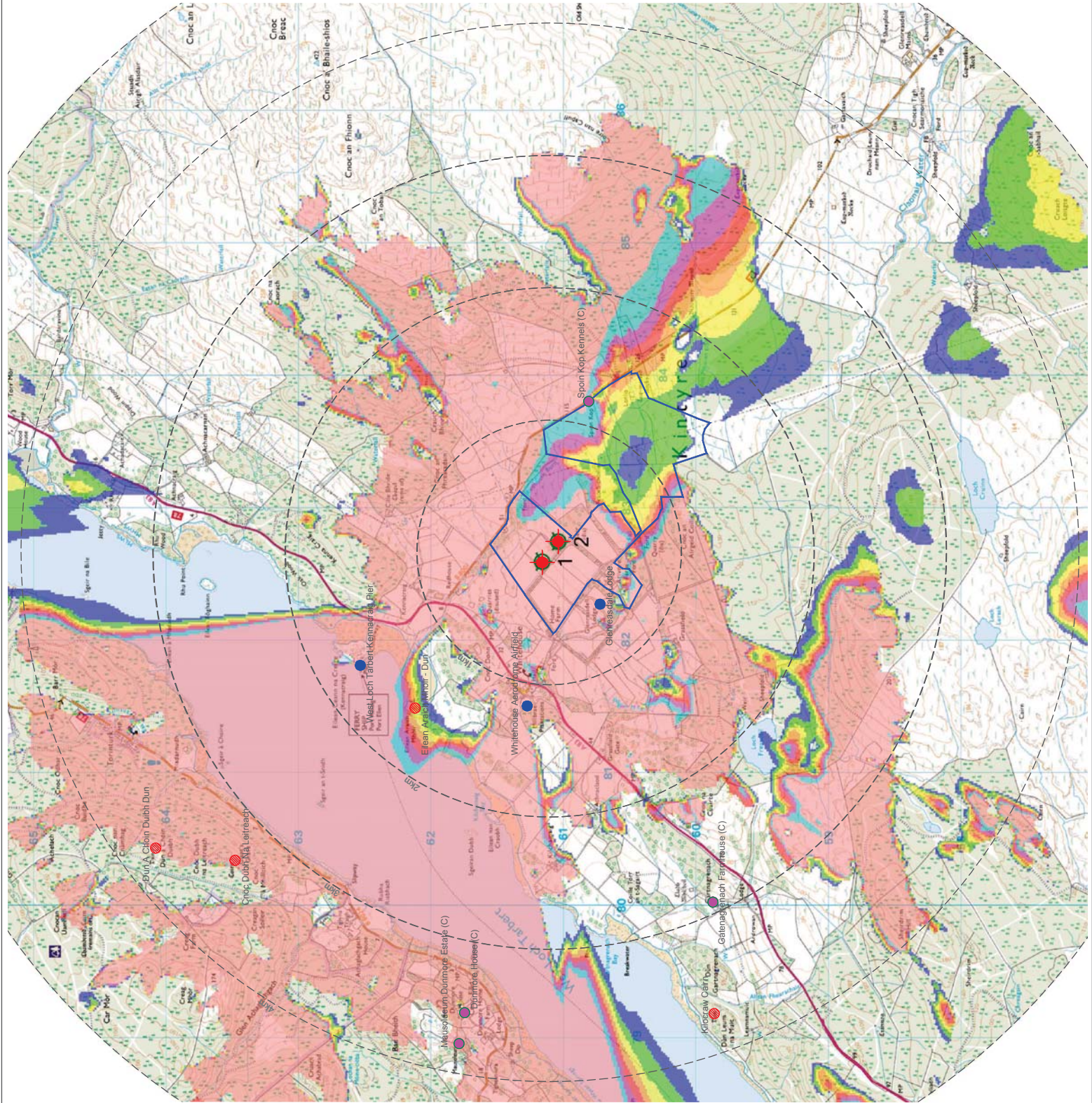
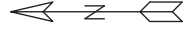
- SCHEDULED MONUMENT



- LISTED BUILDING (AND GRADE)



- CANMORE DATABASE (NATIONAL) RECORD
NOTE: ONLY WITHIN 1KM RADIUS OF DEVELOPMENT



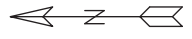
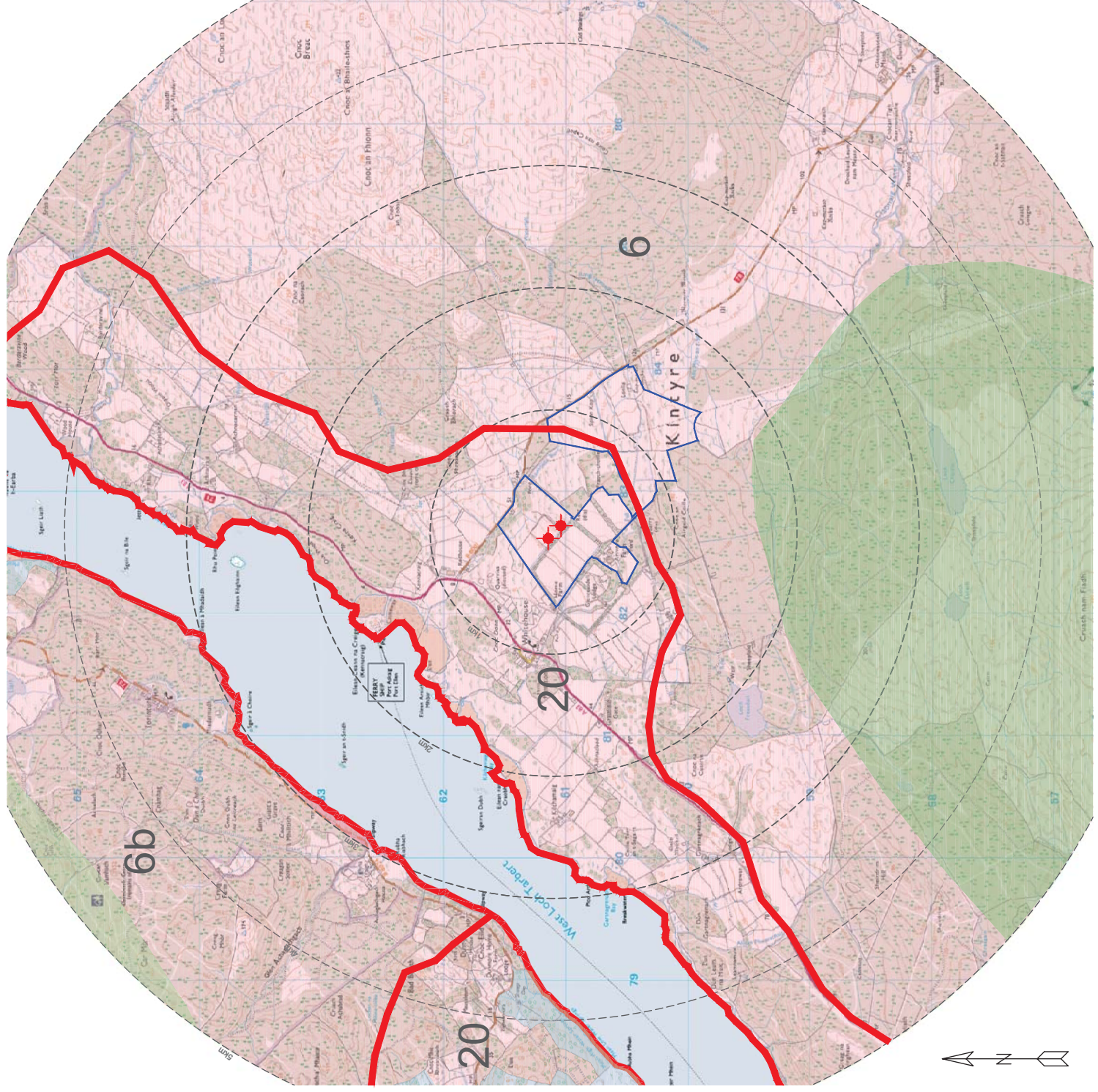
NOTE: PLEASE REFER TO ATTACHED PLANNING SUPPORT STATEMENT FOR FULL DETAILS OF THE SITES ABOVE AND NOTED ON PLAN ADJACENT.

REV	DATE	BY	REASON

	9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk
	PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 1822664.5E, 661104N DRAWN BY: SS SCALE: N.T.S. DATE: 03/07/2013 TITLE: HISTORIC ASSET PLAN DWG NO: HAP01-ZTV

LOCAL LANDSCAPE CHARACTER PLAN KEY

- POTENTIALLY CONSTRAINED AREAS
- PROTECTED AREA
- TURBINE TIP HEIGHT > 80m
- TURBINE TIP HEIGHT 50m - 80m
- UPLAND FOREST MOOR MOSAIC
- KNAPPDALE UPLAND FOREST MOOR MOSAIC
- ROCKY MOSAIC



REV/DATE BY REASON



9 KINGSKNOWE PARK
EDINBURGH
EH14 2JQ
T: 0131 443 0040
W: www.fineenergy.co.uk

PROJECT: Proposed Wind Turbine Installation
CLIENT: Arvore, Whitehouse, Tarbert.
ADDRESS: CENTRE OF SITE - 182664.5E, 661104N

DRAWN BY: SS SCALE: N.T.S. DATE: 23/09/2013
TITLE: LOCAL LANDSCAPE DESIGNATIONS DWG NO: NAT.LAN.01


LOCAL LANDSCAPE CHARACTER PLAN n.t.s. (Z.T.V. REMOVED FOR CLARITY)

LANDSCAPE DESIGNATION PLAN KEY

note: not all designations listed in the key below are found within the study area in the adjacent map, however all efforts have been made to identify their existence.

- AREA OF PANORAMIC QUALITY
- LOCAL NATURE CONSERVATION SITE (ARGYLL AND BUTE COUNCIL)
- SENSITIVE COUNTRYSIDE (ARGYLL AND BUTE COUNCIL)
- RURAL OPPORTUNITY AREA (ARGYLL AND BUTE COUNCIL)
- SETTLEMENT ZONE (ARGYLL AND BUTE COUNCIL)
- COUNTRYSIDE AROUND SETTLEMENT (ARGYLL AND BUTE COUNCIL)
- STRATEGIC / NATIONAL PATH or ROUTE
- CORE PATH
- LOCAL PATH
- TRAFFIC FREE CYCLE ROUTE
- ROUTE 78 (NATIONAL CYCLE ROUTE)
- CUMULATIVE TURBINE SITE AND NAME
- CUMULATIVE TURBINE SITE AND NAME (PLANNING SUBMITTED / PENDING / SCREENING / SCOPING)

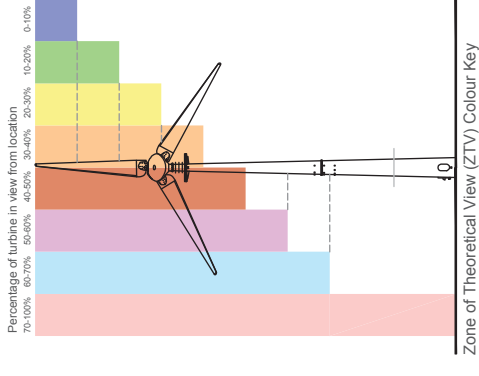


REV	DATE	BY	REASON
			
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT:	Proposed Wind Turbine Installation		
CLIENT:	Arvore, Whitehouse, Tarbert.		
ADDRESS:	CENTRE OF SITE - 182664.5E, 661104N		
SITE / CO-ORD:			
DRAWN BY:	SS	SCALE:	N.T.S.
TITLE:	LANDSCAPE DESIGNATION PLAN	DATE:	23/09/2013
		DWG NO.:	NAT.LAN.02

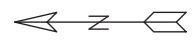
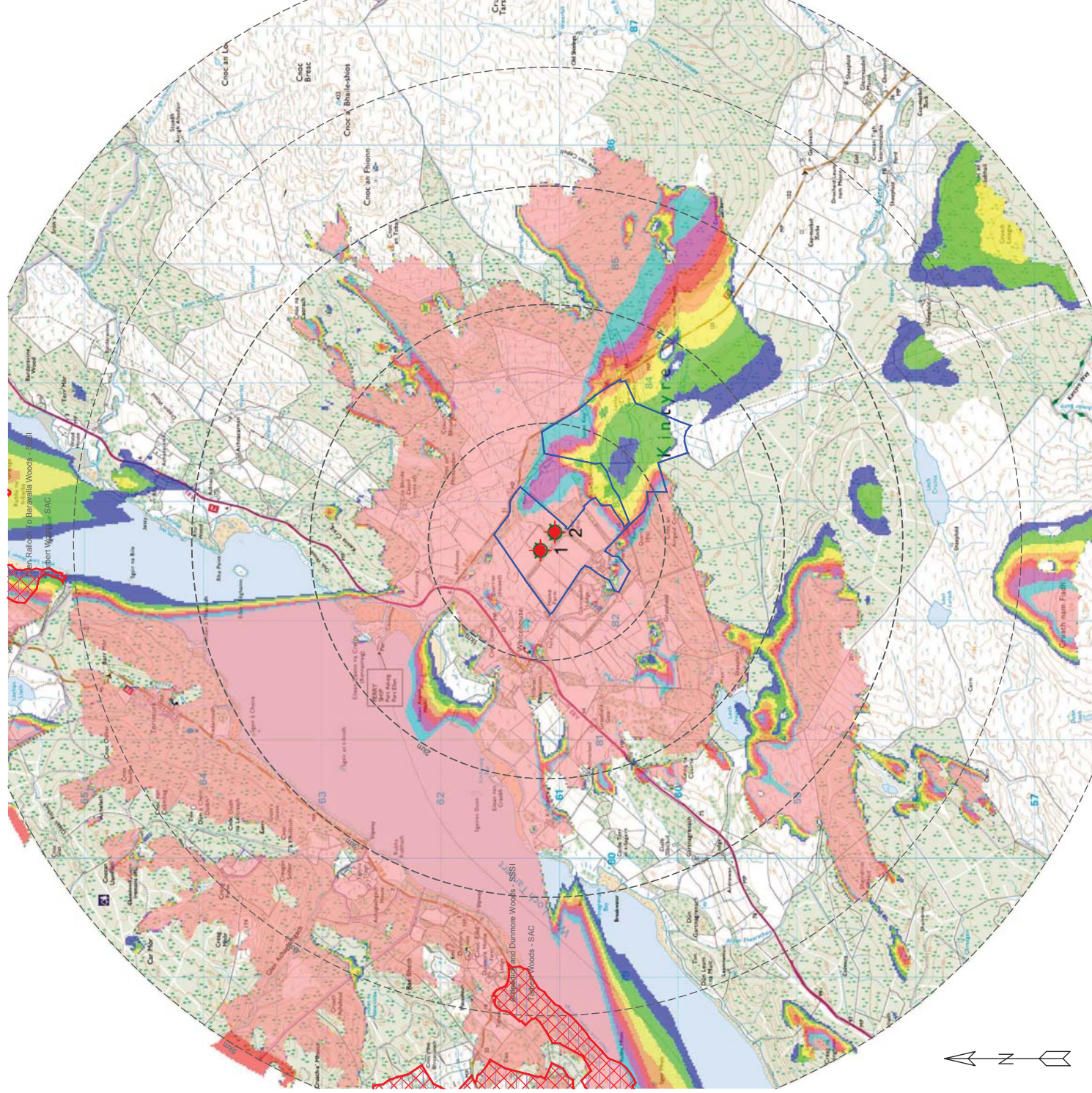
LANDSCAPE DESIGNATION PLAN n.t.s. (Z.T.V. REMOVED FOR CLARITY)

NATURAL ASSET PLAN KEY

note: not all designations listed in the key below are found within the study area in the adjacent map, however all efforts have been made to identify their existence.



- NATIONAL DESIGNATED GARDEN OR HISTORIC DESIGNED LANDSCAPE
- SITE OF SPECIAL SCIENTIFIC INTEREST
- LOCALLY DESIGNATED SITES OF INTEREST TO NATURAL SCIENCE
- SPECIAL AREA OF CONSERVATION
- SPECIAL PROTECTION AREA
- RAMSAR SITE
- NATIONAL NATURE RESERVE

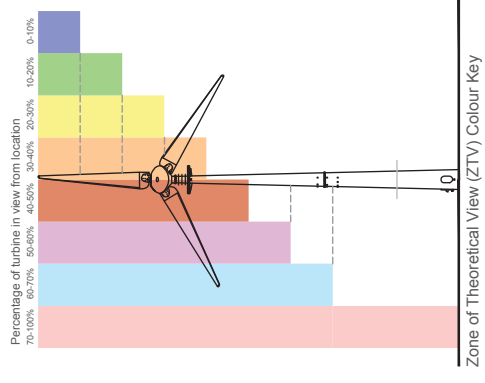


REV	DATE	BY	REASON
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182664.5E, 661104N			
DRAWN BY: SS SCALE: N.T.S. DATE: 24/09/2013 TITLE: NATURAL ASSET PLAN DWG NO: NATLAN.03			

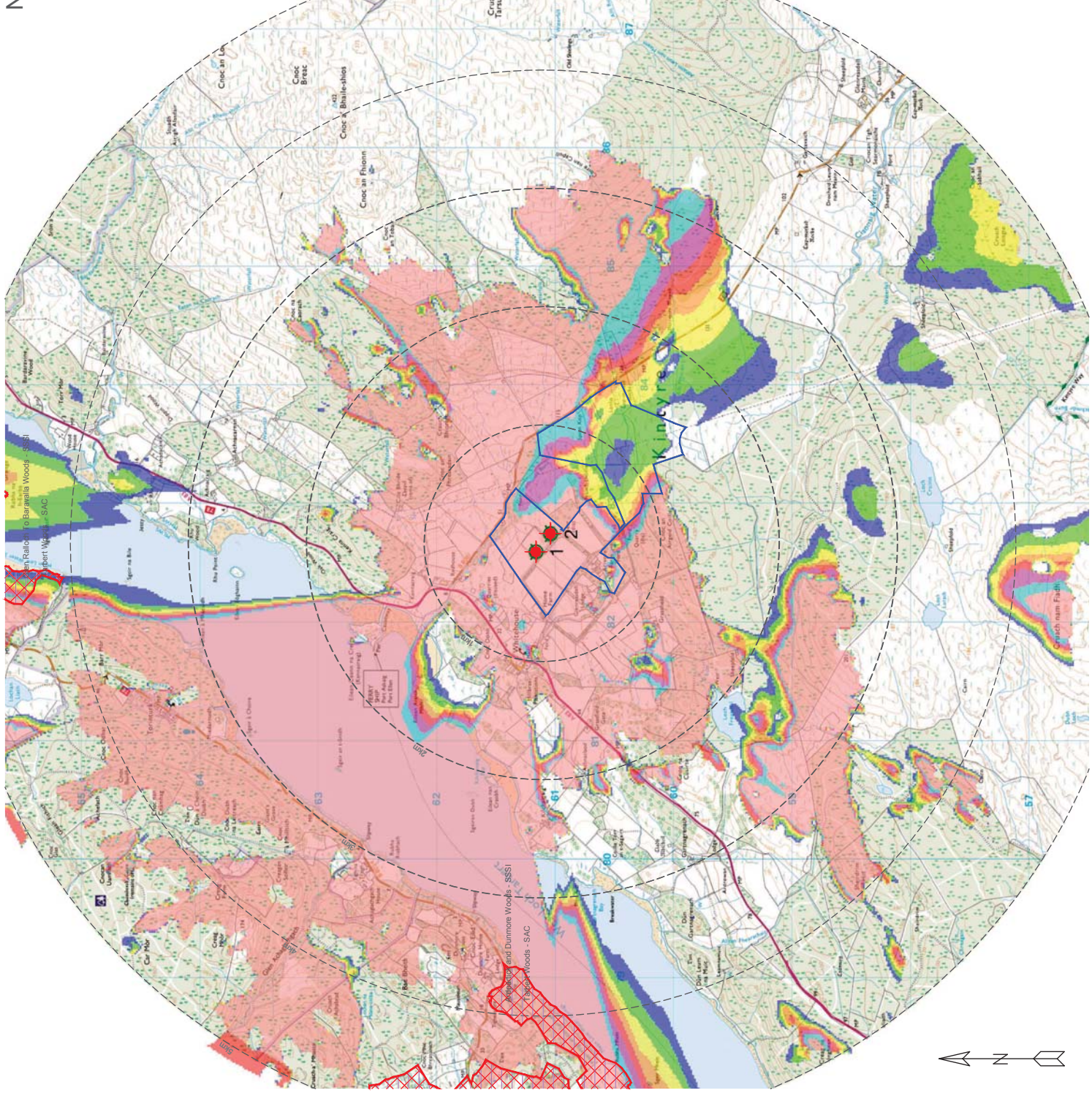
NATURAL ASSET PLAN n.t.s. (with 5km radius ZTV super-imposed)

NATIONAL NATURAL / LANDSCAPE ASSET KEY

note: not all designations listed in the key below are found within the study area in the adjacent map, however all efforts have been made to identify their existence.

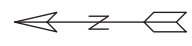


- NATIONAL DESIGNATED GARDEN OR HISTORIC DESIGNED LANDSCAPE
- SITE OF SPECIAL SCIENTIFIC INTEREST
- LOCALLY DESIGNATED SITES OF INTEREST TO NATURAL SCIENCE
- SPECIAL AREA OF CONSERVATION
- SPECIAL PROTECTION AREA
- RAMSAR SITE
- NATIONAL NATURE RESERVE



NOTE: PLEASE REFER TO ATTACHED PLANNING SUPPORT STATEMENT FOR FULL DETAILS OF THE SITES ABOVE AND NOTED ON PLAN ADJACENT. NUMBERS NOTED REFER TO THE NUMBERED LIST IN THE DESIGNATION PORTION OF THE PLANNING SUPPORT STATEMENT.

REV	DATE	BY	REASON
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tarbert. ADDRESS: Arivore, Whitehouse, Tarbert. SITE / CO-ORD: CENTRE OF SITE - 182664.5E, 661104N			
DRAWN BY: SS		SCALE: N.T.S.	DATE: 23/05/2013
TITLE: LANDSCAPE ASSETS PLAN n.t.s. (with 5km radius ZTV super-imposed)			
			DWG NO: NAT.LAN.01






NATIONAL NATURAL / LANDSCAPE ASSETS PLAN n.t.s. (with 5km radius ZTV super-imposed)

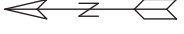
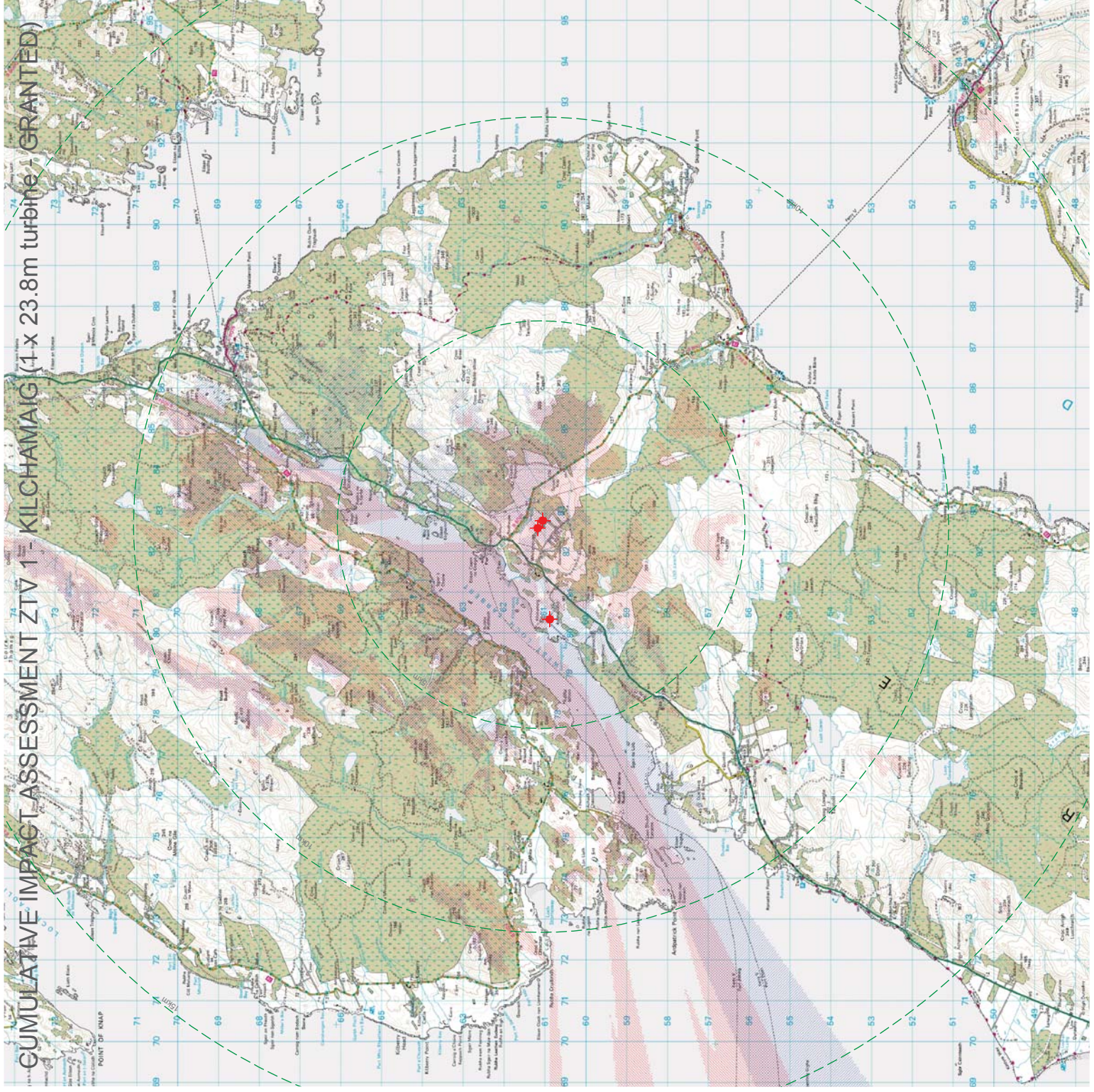
CUMULATIVE ZONE OF THEORETICAL VIEW
for Proposed Wind Turbine Installation


SCALE 1:100000

GENERATED WITH OS 50m PROFILE (TOPOGRAPHY ONLY)
INFORMATION, 2 x 34.6m ROTOR TIP HEIGHT (APPLICATION SITE),
A 23.8m ROTOR TIP HEIGHT (REFERENCED CUMULATIVE SITE)
AND A 2m RECEIVER HEIGHT.

**NOTE: CURVATURE OF THE EARTH AND LIGHT REFLECTION IS
TAKEN INTO ACCOUNT.**

-  Both Application & Cumulative Impact Site in View
-  Cumulative Impact Site in View only
-  Application Site in View only



REV	DATE	BY	REASON
			
PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182664.5E, 661104N DRAWN BY: SS SCALE: N.T.S. DATE: 03/07/2013 TITLE: CUMULATIVE ZTV PLAN 1			
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
DWG NO: CIS.ZTV01			




CUMULATIVE ZONE OF THEORETICAL VIEW

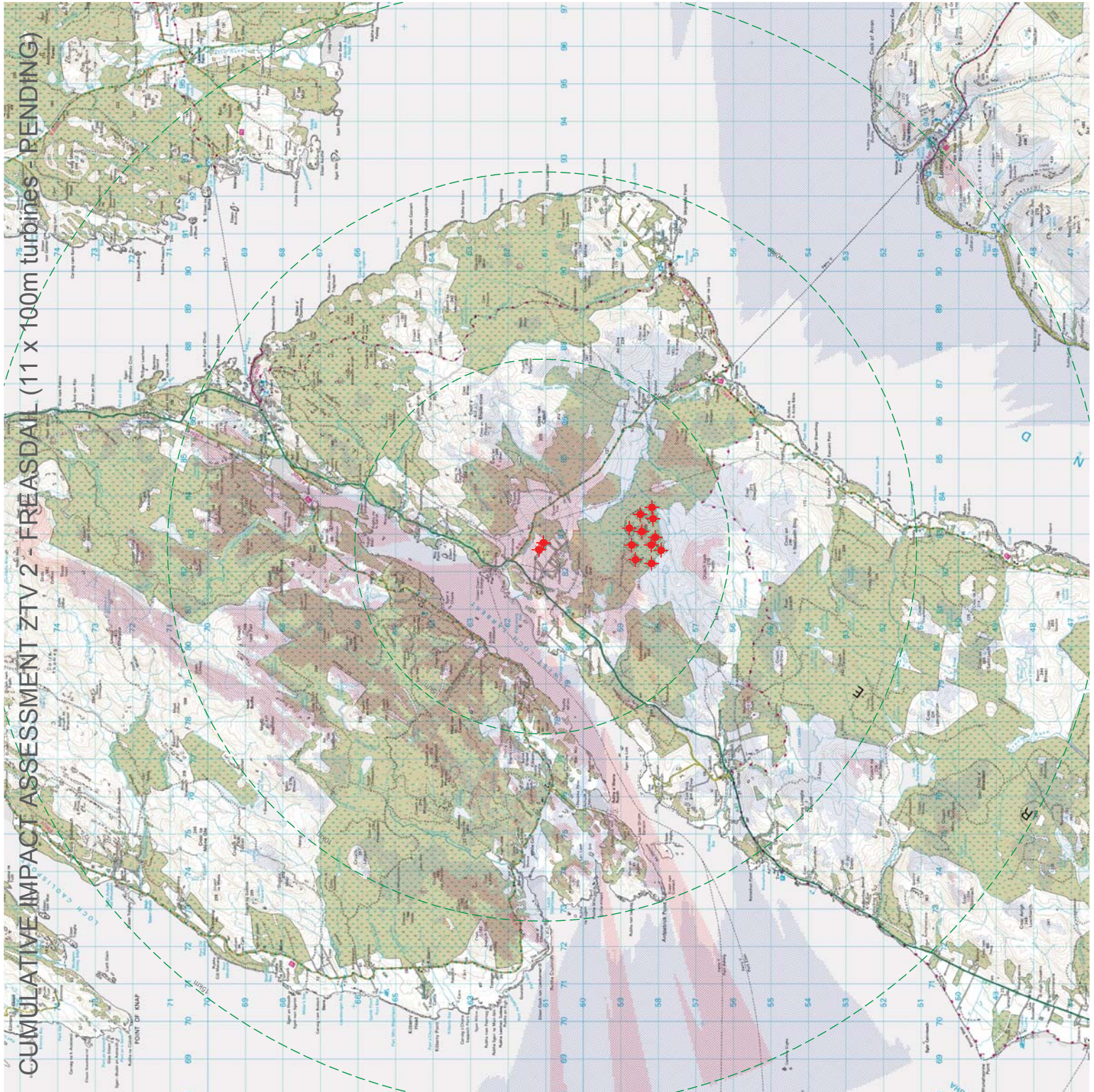
for Proposed Wind Turbine Installation

SCALE 1:100000

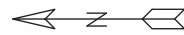
GENERATED WITH OS 50m PROFILE (TOPOGRAPHY ONLY)
 INFORMATION, 2 x 34.6m ROTOR TIP HEIGHT (APPLICATION SITE),
 11 x 100m ROTOR TIP HEIGHT (REFERENCED CUMULATIVE SITE)
 AND A 2m RECEIVER HEIGHT.


**NOTE: CURVATURE OF THE EARTH AND LIGHT REFLECTION IS
 TAKEN INTO ACCOUNT.**

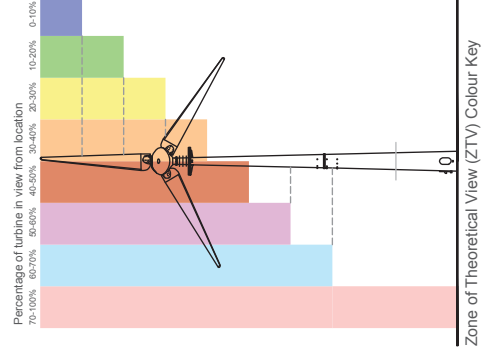
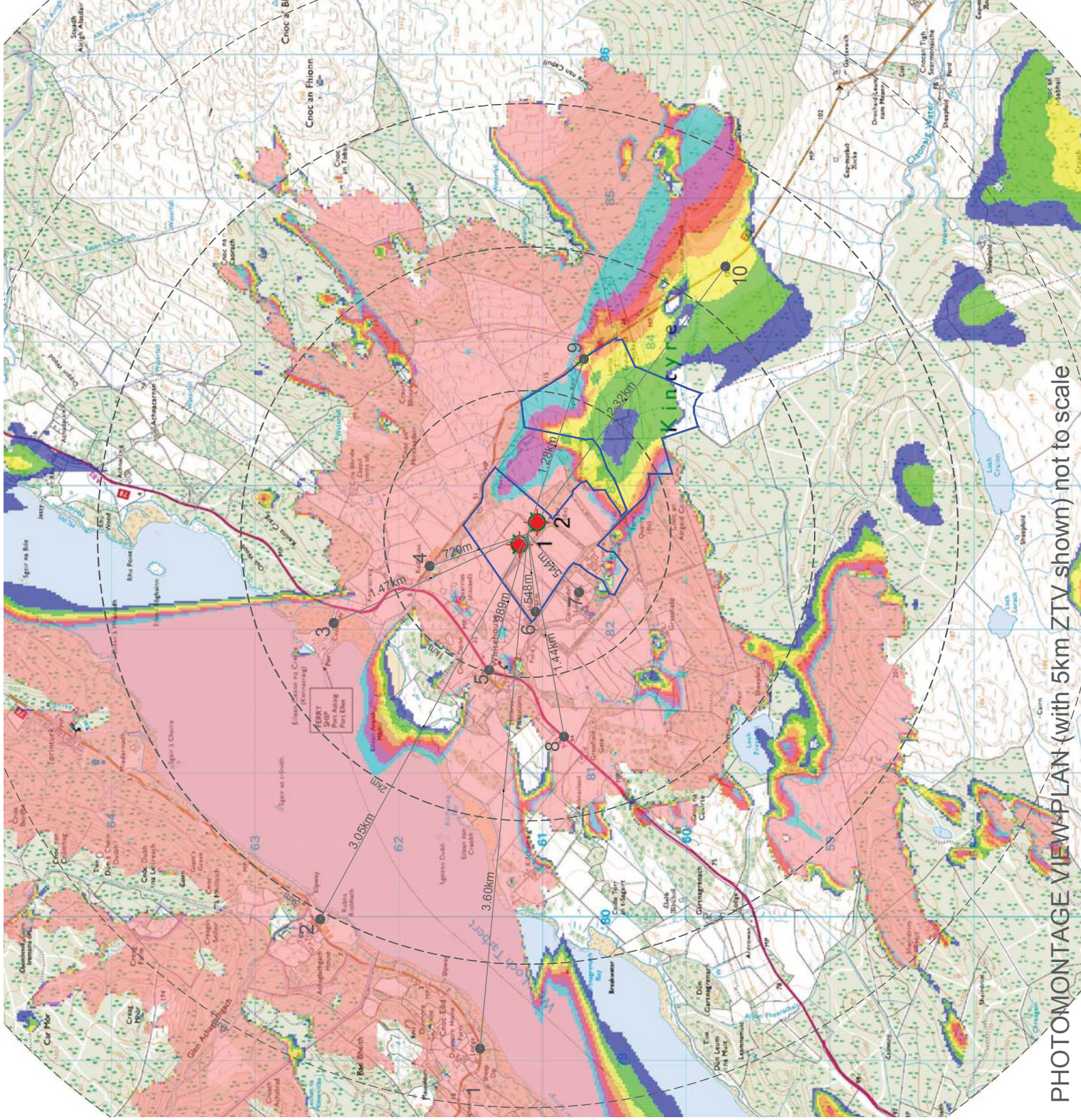
-  Both Application & Cumulative Impact Site in View
-  Cumulative Impact Site in View only
-  Application Site in View only



CUMULATIVE IMPACT ASSESSMENT ZTV 2 - FREASDAIL (11 x 100m turbines - PENDING)



REV	DATE	BY	REASON
			
PROJECT: CLIENT: ADDRESS: SITE / CO-ORD:			
DRAWN BY: SS SCALE: N.T.S. DATE: 03/07/2013 TITLE: CUMULATIVE ZTV PLAN 2			
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
Proposed Wind Turbine Installation Arvore, Whitehouse, Tarbert. CENTRE OF SITE - 182664.5E, 661104N			



PHOTOMONTAGE VIEW PLAN (with 5km ZTV shown) not to scale

REV	DATE	BY	REASON
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT:	Proposed Wind Turbine Installation		
CLIENT:	Arvore, Whitehouse, Tarbert.		
ADDRESS:	CENTRE OF SITE - 182664.5E, 661104N		
SITE / CO-ORD:			
DRAWN BY:	SS	SCALE:	N.T.S.
TITLE:	MONTAGE VIEWS & 5km ZTV		DATE: 03/07/2013 DWG NO: PMV01-ZTV



VIEW 1 - wireframe

Looking east from Dalmore House

CO-ORDINATES OF VIEW POINT - 178996E, 661438N

DISTANCE TO APPLICATION TURBINES - 3.6Km

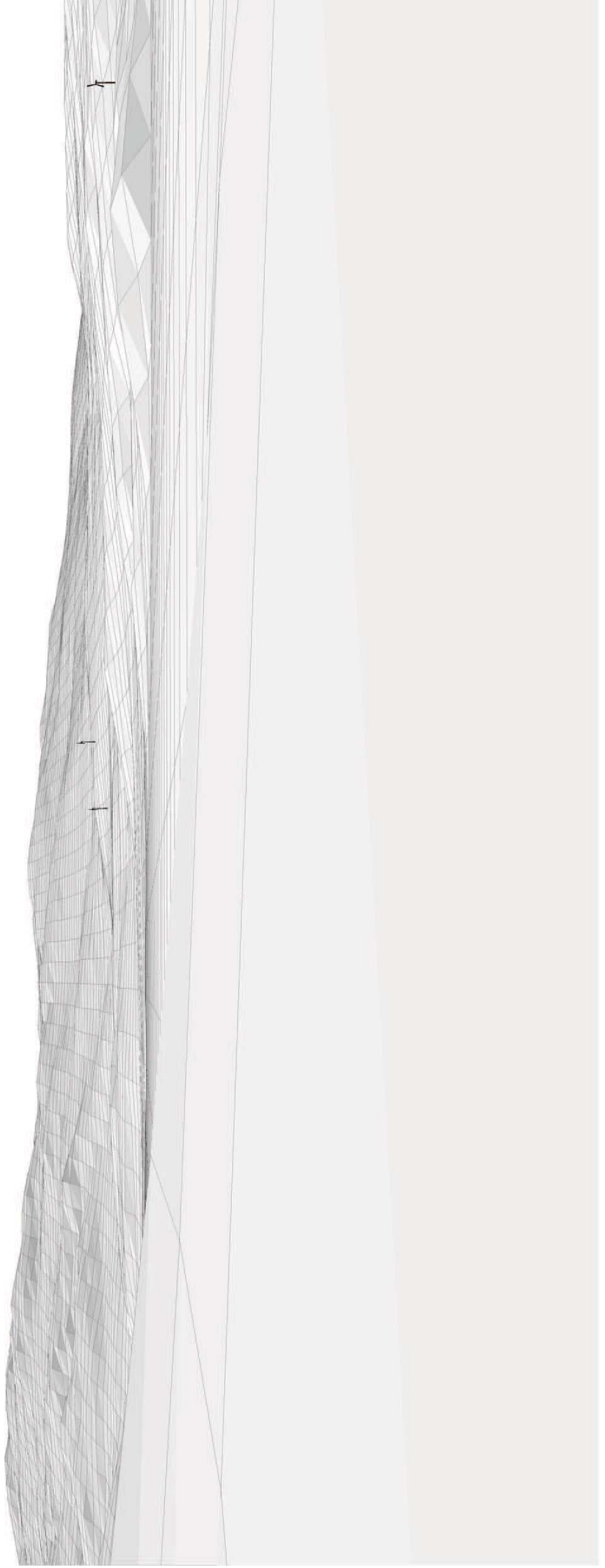
ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (14:09)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

1no. 23.8m turbine @
Kilmahaig Farm, Tarbert
status: Approved





VIEW 1

Looking east from Dalmore House

CO-ORDINATES OF VIEW POINT - 178996E, 661438N

DISTANCE TO APPLICATION TURBINES - 3.6Km

ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (14:09)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.





VIEW 2 - wireframe

Looking east from Tigh Na Traich

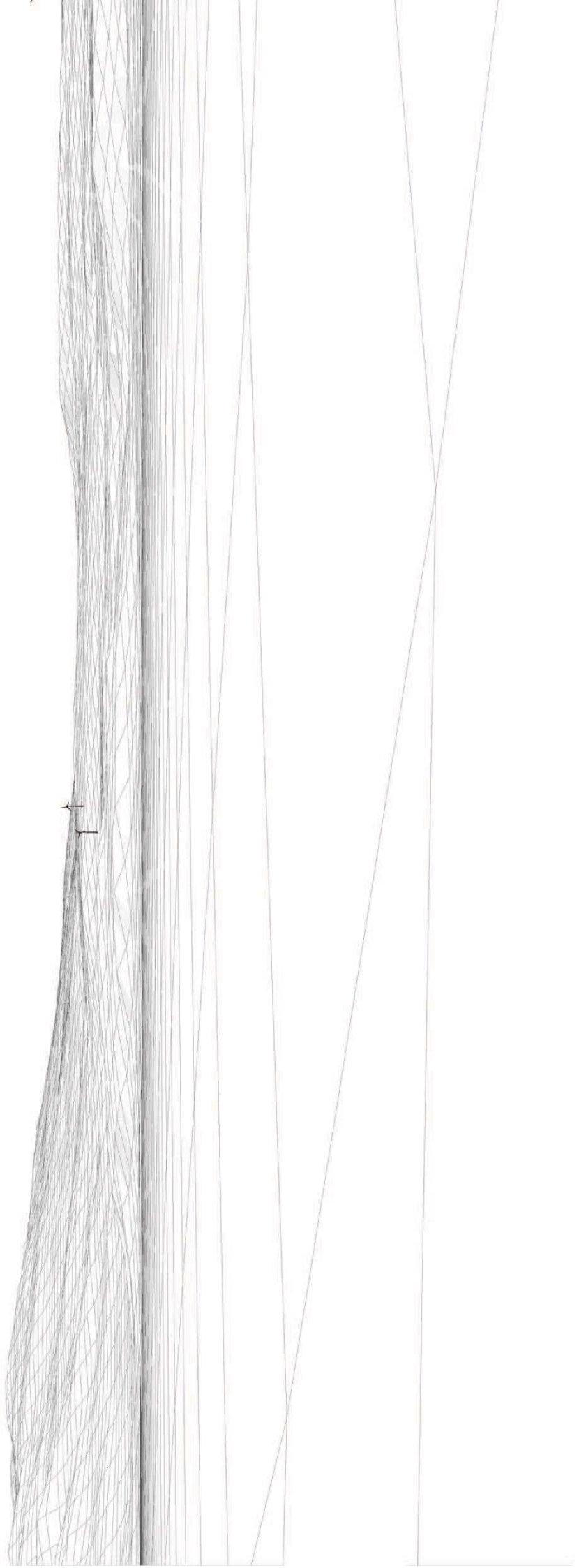
CO-ORDINATES OF VIEW POINT - 179976E, 662568N

DISTANCE TO APPLICATION TURBINES - 3.05Km

ORIENTATION OF VIEW - 135degrees

PHOTOGRAPH DATE - 28th May 2013 (13:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 2 - wireframe

Looking east from Tigh Na Traich

CO-ORDINATES OF VIEW POINT - 179976E, 662568N

DISTANCE TO APPLICATION TURBINES - 3.05Km

ORIENTATION OF VIEW - 135degrees

PHOTOGRAPH DATE - 28th May 2013 (13:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 3 - wireframe

Looking southeast from Port Askaig

CO-ORDINATES OF VIEW POINT - 181964E, 662568N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:26)

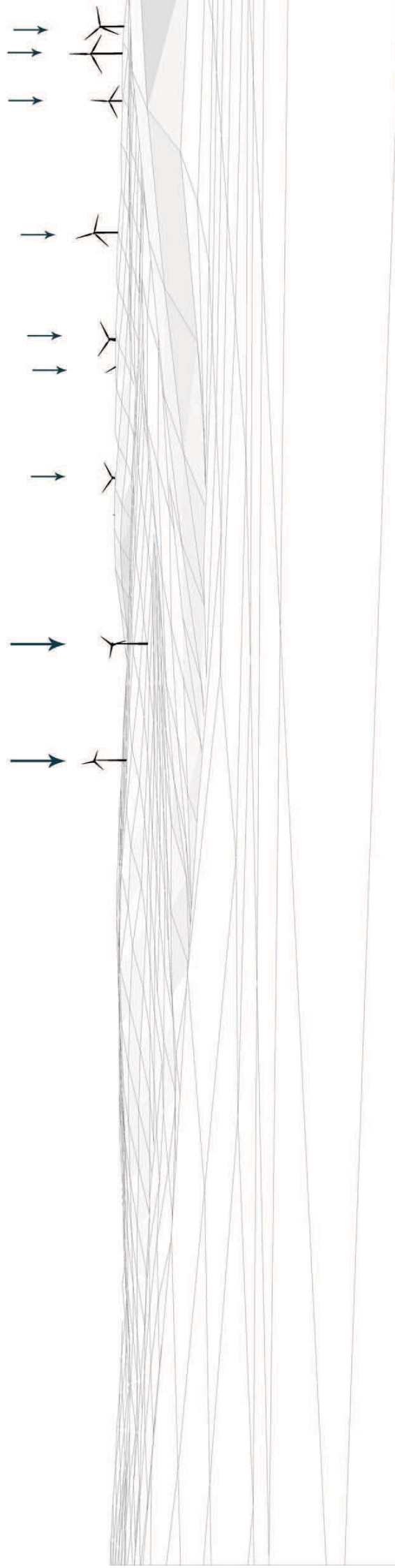
CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

11no. 100m turbine @

Freasdail Wind Farm, Whitehouse

status: Pending



VIEW 3

Looking southeast from Port Askaig

CO-ORDINATES OF VIEW POINT - 181964E, 662568N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:26)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

11no. 100m turbine @
Freasdail Wind Farm, Whitehouse
status: Pending



VIEW 4 - wireframe

Looking east from Bluebell Cottage

CO-ORDINATES OF VIEW POINT - 182473E, 661750N

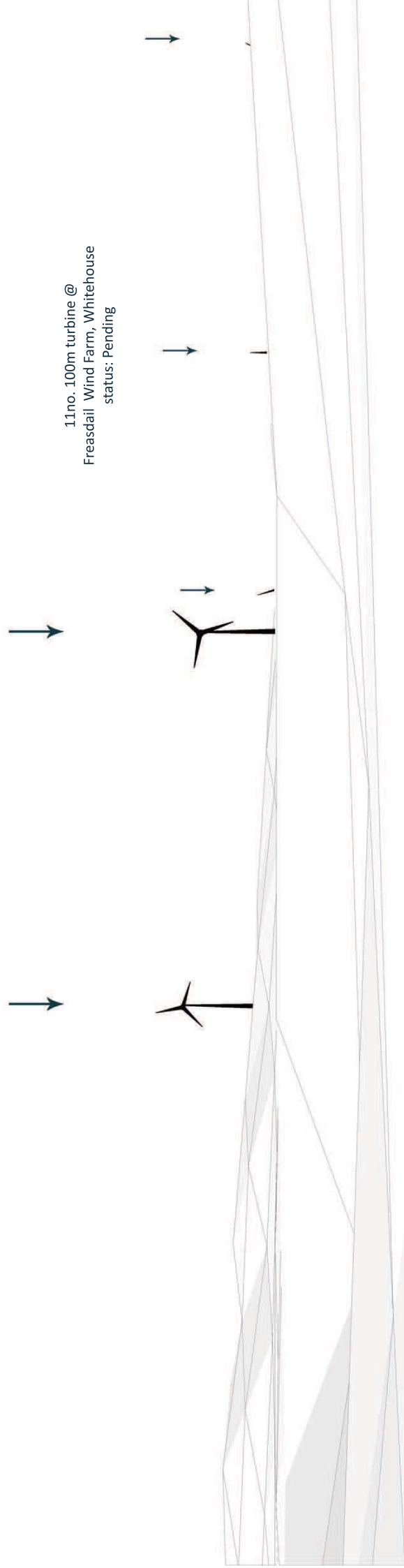
DISTANCE TO APPLICATION TURBINES - 720m

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:34)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



11no. 100m turbine @
Freasdail Wind Farm, Whitehouse
status: Pending

VIEW 4

Looking east from Bluebell Cottage

CO-ORDINATES OF VIEW POINT - 182473E, 661750N

DISTANCE TO APPLICATION TURBINES - 700m

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:34)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



11no. 100m turbine @
Freasdail Wind Farm, Whitehouse
status: Pending



VIEW 5 - wireframe

Looking east from Whitehouse

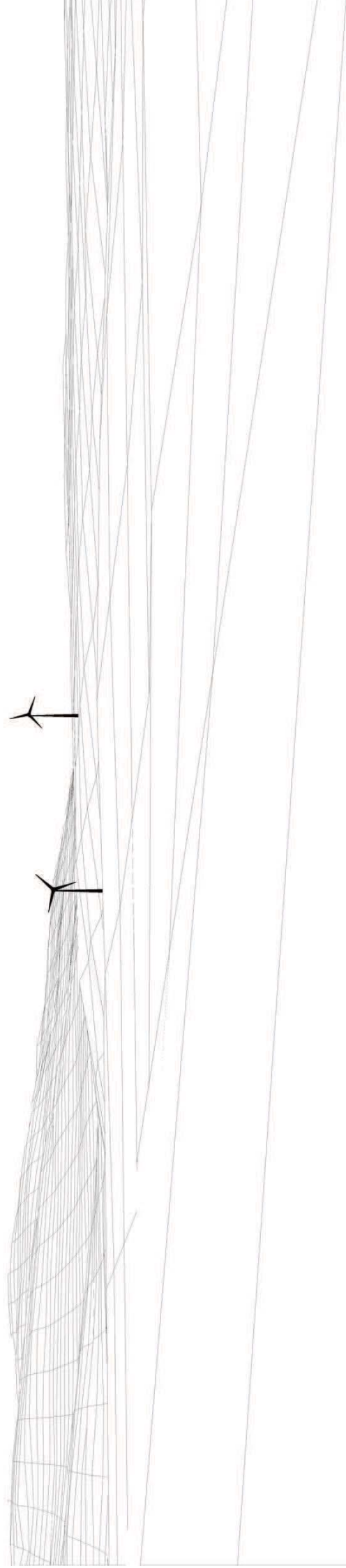
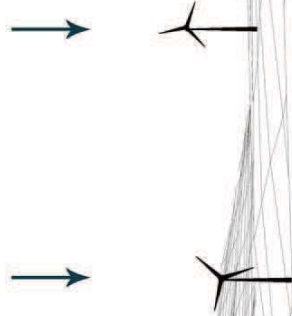
CO-ORDINATES OF VIEW POINT - 181720E, 661378N

DISTANCE TO APPLICATION TURBINES - 989m

ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (12:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @ A4.



VIEW 5

Looking east from Whitehouse

CO-ORDINATES OF VIEW POINT - 181720E, 661378N

DISTANCE TO APPLICATION TURBINES - 989m

ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (12:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 6 - wireframe

Looking Northeast, near Home Farm

CO-ORDINATES OF VIEW POINT - 182106E, 661016N

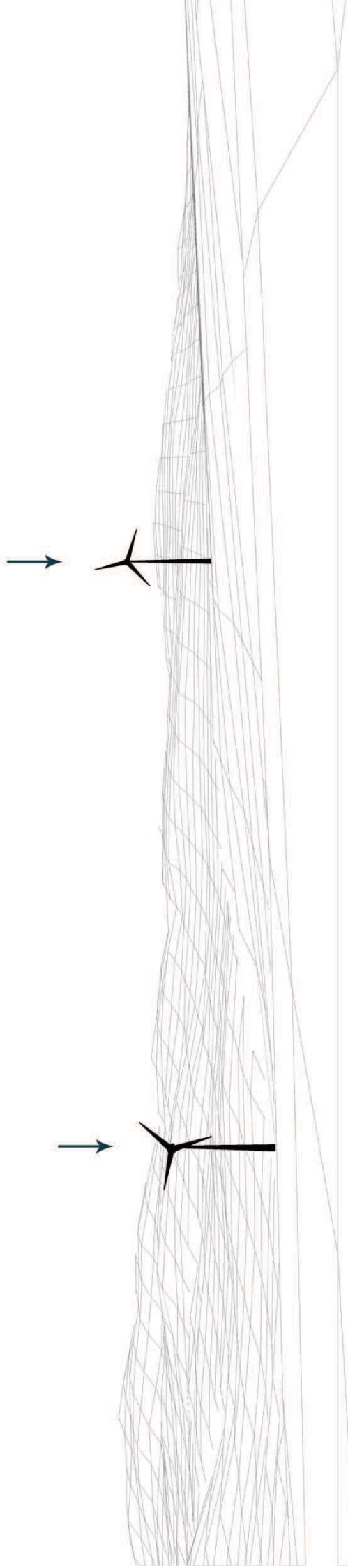
DISTANCE TO APPLICATION TURBINES - 544m

ORIENTATION OF VIEW - 85degrees

PHOTOGRAPH DATE - 28th May 2013 (13:02)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 6

Looking Northeast from near Home Farm

CO-ORDINATES OF VIEW POINT - 182106E, 661016N

DISTANCE TO APPLICATION TURBINES - 540m

ORIENTATION OF VIEW - 85degrees

PHOTOGRAPH DATE - 28th May 2013 (13:02)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 7 - wireframe

Looking Northeast from Glenreasdell Lodge

CO-ORDINATES OF VIEW POINT - 182257E, 660725N

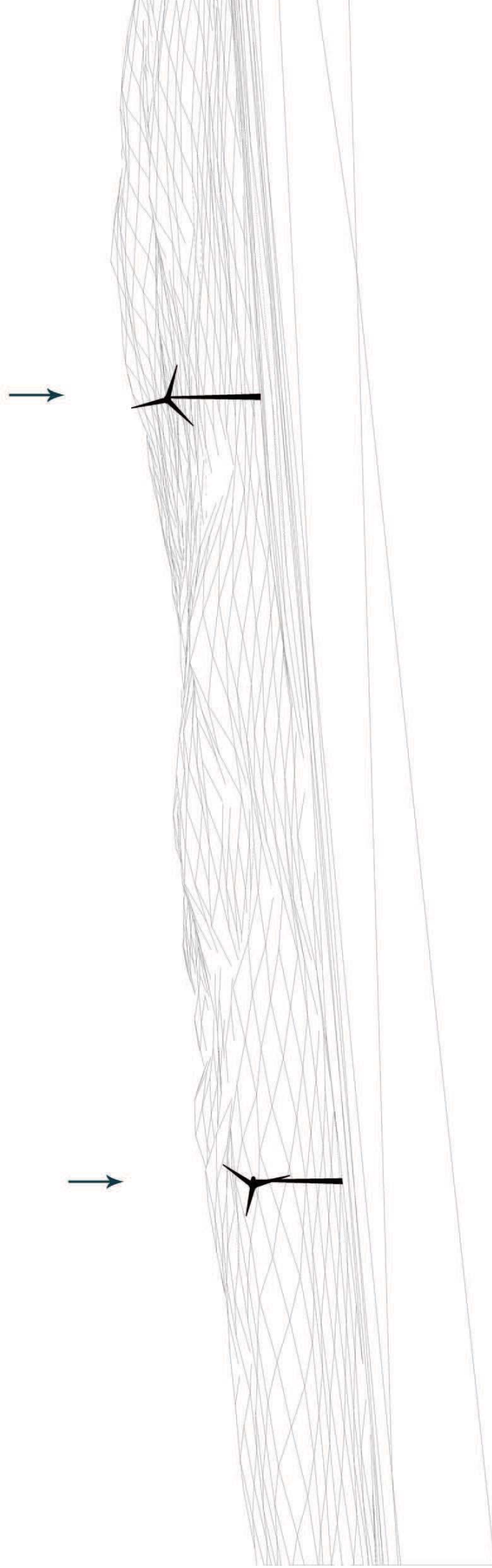
DISTANCE TO APPLICATION TURBINES - 467m

ORIENTATION OF VIEW - 47degrees

PHOTOGRAPH DATE - 28th May 2013 (13:13)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 7

Looking Northeast from Glenreadsell Lodge

CO-ORDINATES OF VIEW POINT - 182257E, 660725N

DISTANCE TO APPLICATION TURBINES - 467m

ORIENTATION OF VIEW - 47degrees

PHOTOGRAPH DATE - 28th May 2013 (13:13)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 8 - wireframe

Looking East from the A83

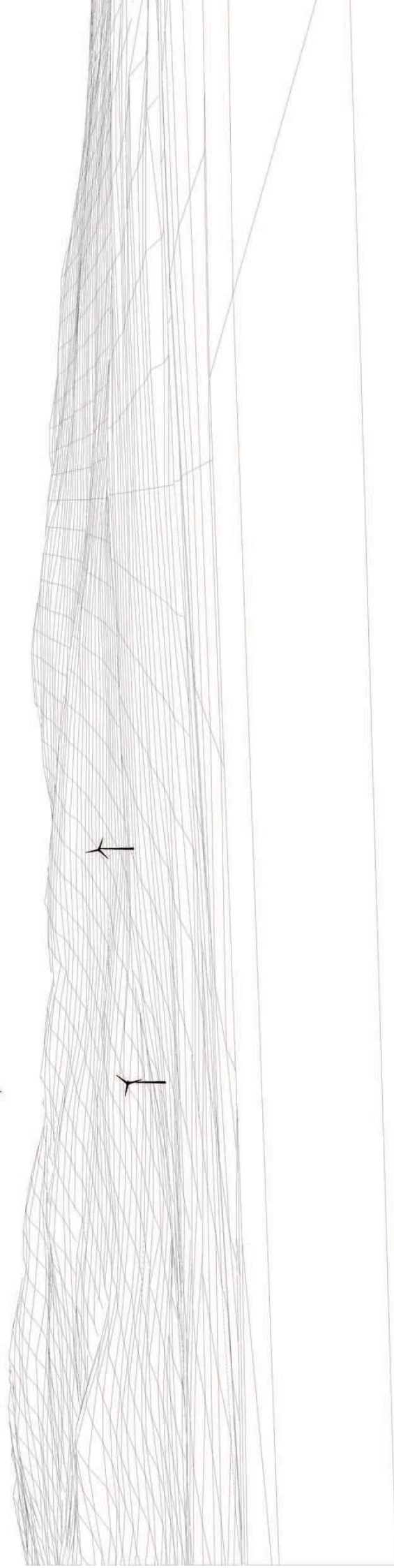
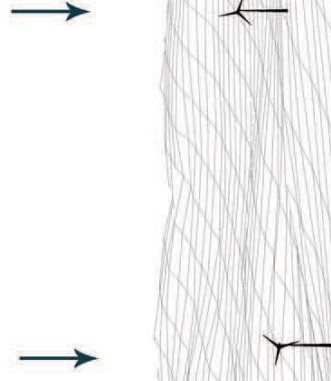
CO-ORDINATES OF VIEW POINT - 181223E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 79degrees

PHOTOGRAPH DATE - 28th May 2013 (13:19)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 8

Looking East from the A83

CO-ORDINATES OF VIEW POINT - 181223E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 79degrees

PHOTOGRAPH DATE - 28th May 2013 (13:19)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 9 - wireframe

Looking Northwest from Spion Kop

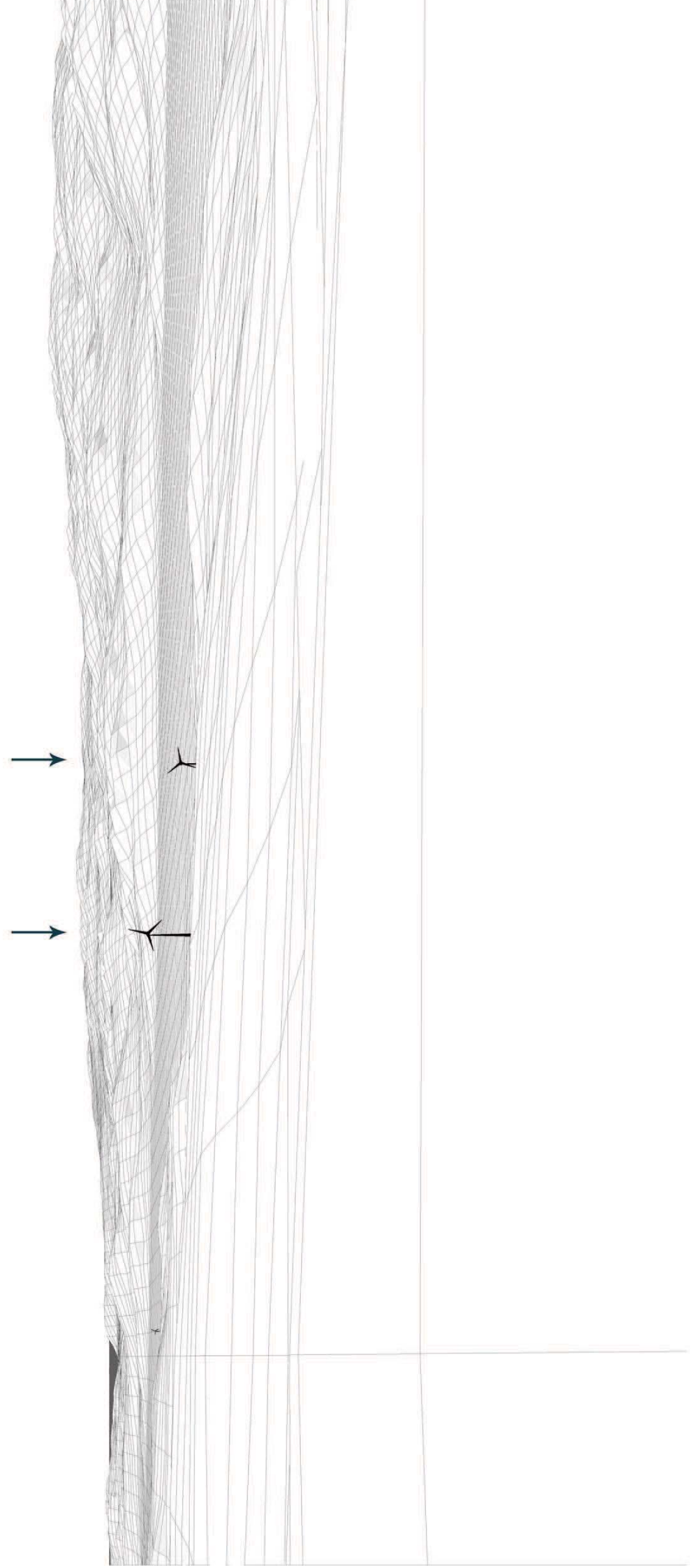
CO-ORDINATES OF VIEW POINT - 183778E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.28Km

ORIENTATION OF VIEW - 283degrees

PHOTOGRAPH DATE - 28th May 2013 (12:40)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 9

Looking Northwest from Spion Kop

CO-ORDINATES OF VIEW POINT - 183778E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.28Km

ORIENTATION OF VIEW - 283degrees

PHOTOGRAPH DATE - 28th May 2013 (12:40)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 10 - wireframe

Looking Northwest from the B8001

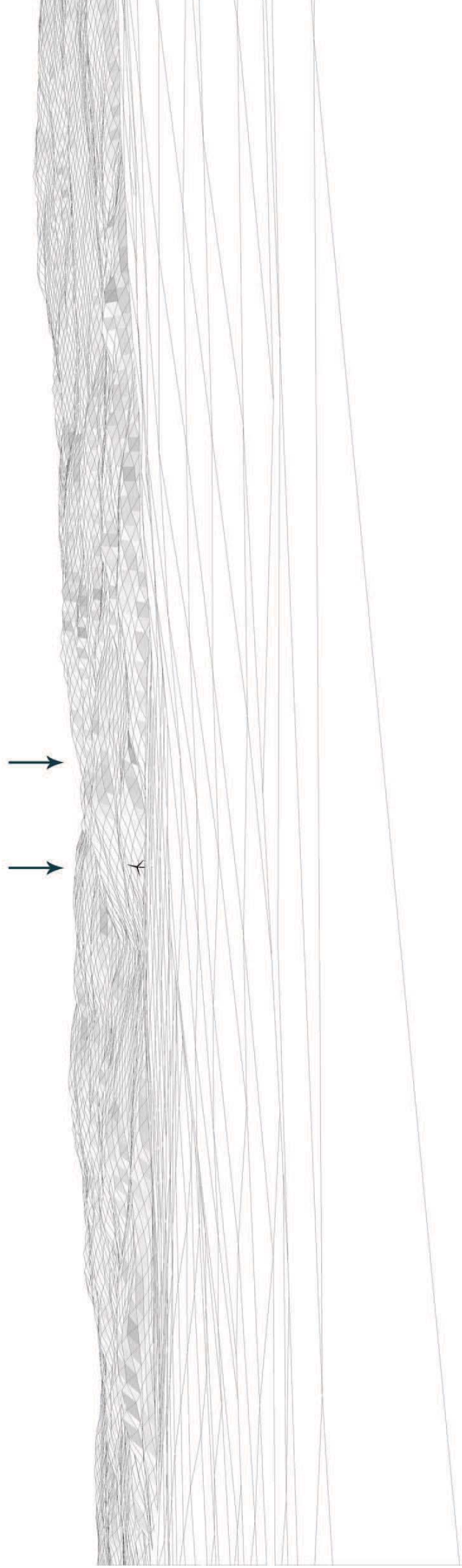
CO-ORDINATES OF VIEW POINT - 184469E, 659822N

DISTANCE TO APPLICATION TURBINES - 2.2Km

ORIENTATION OF VIEW - 306degrees

PHOTOGRAPH DATE - 28th May 2013 (12:44)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 10

Looking Northwest from the B8001

CO-ORDINATES OF VIEW POINT - 184469E, 659822N

DISTANCE TO APPLICATION TURBINES - 2.2Km

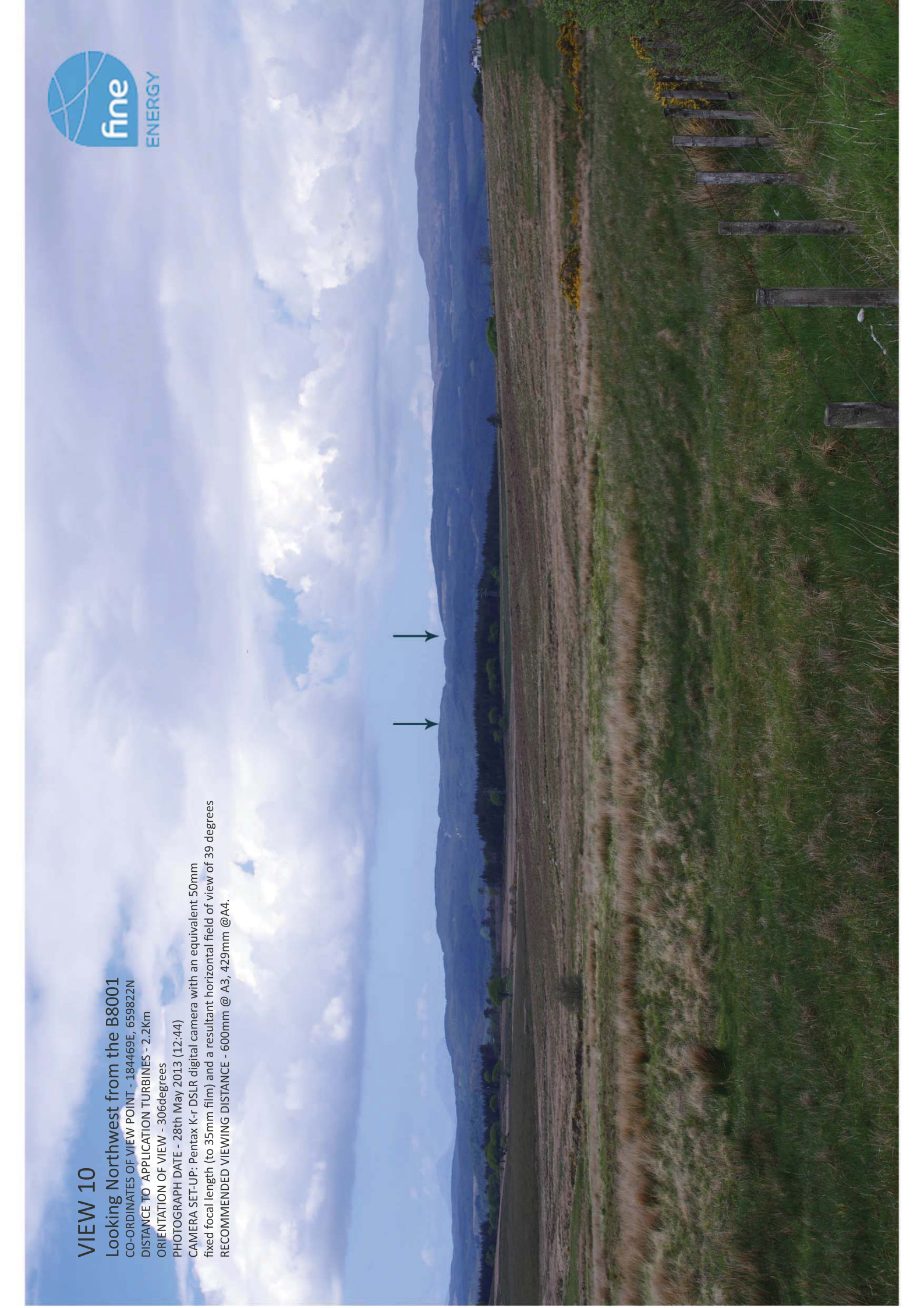
ORIENTATION OF VIEW - 306degrees

PHOTOGRAPH DATE - 28th May 2013 (12:44)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.





APPENDIX 3 : Noise SUPPORTING INFORMATION LIST

ARIVORE FARM planning application

Doc	Title	Drg. No	S / S	Rev
23	Noise Report			
24	Hayes McKenzie Noise Test Report			

**GH WindFarmer Noise Report
Proposed Wind Turbine at
Arivore, Whitehouse, Tarbert, PA29 6XR.
13 June 2013**

1 Project: Arivore - Turbine types

Turbine type	Endurance E-3120	
Diameter	19.0	m
Hub height	23.8	m
Number of blades	3	
Air density for power curve	1.225	kg/m ³
Power regulation	Pitch	
Cut-In windspeed	3.5	m/s
Cut-Out windspeed	25.0	m/s



Turbine noise options:

Turbine produces tonal noise

No

Noise in octave bands

Yes

Octave band (Hz)	Sound Power Level (dB(A))
31.5	66.23
63.0	76.63
125.0	85.03
250.0	90.03
500.0	88.93
1000.0	90.23
2000.0	93.13
4000.0	90.83
8000.0	77.83

Table 1 - Sound Power Level for Endurance E-3120

Specify absolute sound power level

No

Specify variation of sound power level with wind speed

Yes

Reference height

10.00

m

Reference wind speed

10.00

m/s

Wind speed (m/s)	Difference to Reference (dB(A))
0.0	-94.80
1.0	-94.80
2.0	-94.80
3.0	-7.80
4.0	-6.80
5.0	-6.60
6.0	-6.10
7.0	-5.20
8.0	-3.60
9.0	-1.80
10.0	0.00
11.0	1.10
12.0	1.10
13.0	1.10
14.0	1.10
15.0	1.10
16.0	1.10
17.0	1.10
18.0	1.10
19.0	1.10
20.0	1.10

Table 2 - Noise as a function of windspeed for Endurance E-3120

2 Project: Arivore - Turbines Table

Turbine ID	Turbine label	Turbine type name	Hub height (m)	Rotor diameter (m)	Capacity (kW)
1	Application Turbine 1	Endurance E-3120	23.8	19.0	50
2	Application Turbine 2	Endurance E-3120	23.8	19.0	50

Table 3 - Turbines Table - Part 1

Turbine ID	Eastings (m)	Northings (m)	Height of base (m)	Nearest turbine ID	Distance to nearest turbine (m)
1	182588.0	661166.0	53	0	0.0
2	182741.0	661042.0	76	0	0.0

Table 4 - Turbines Table - Part 2

3 Workbook noise options

Form of noise model to be used	Complex (ISO9613) General	
Ground Effect	Porous Ground	
Ground Effect	ISO9613 General	
Ground factor around turbines	0.50	
Ground factor everywhere else	0.50	
Meteorological correction factor Co	0.00	dB
Other attenuations to be considered	2.00	dB (Conversion of descriptor)
Initial default noise limit to use when placing dwellings	35.00	dB(A)
Relative to background noise	0.00	dB(A)
Calculation grid spacing	10.00	m
Height above ground for noise mapping	2.00	m
Use DTM height data	Yes	
Octave Spreading	Yes	

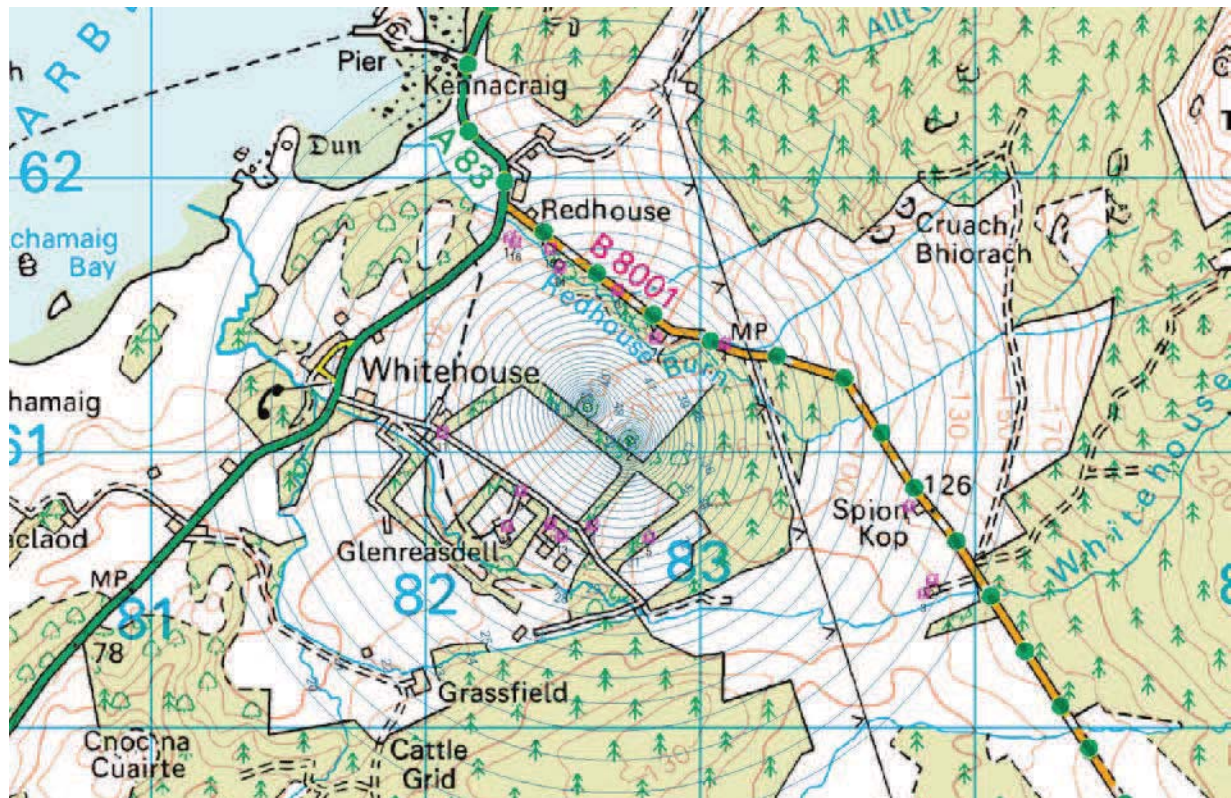
Octave band (Hz)	Attenuation coefficient (dB/km)
31.5	0.00
63.0	0.10
125.0	0.40
250.0	1.00
500.0	1.90
1000.0	3.70
2000.0	9.70
4000.0	32.80
8000.0	117.00

Table 6 - Atmospheric Attenuation for Octave Bands of Noise

4 Project: Arivore - Dwellings

Dwelling ID	Dwelling name	Distance to nearest turbine (m)	Eastings (m)	Northings (m)	Altitude (m)	Turbine exclusion radius (m)
1	Spion Kop	1043.8	183758.0	660807.0	122.2	0.0
2	Redesdale House	1212.8	183845.0	660540.0	110.1	0.0
3	Lonlia	1205.3	183813.0	660491.0	106.3	0.0
4	Craig's View	500.0	183089.0	661401.0	56.2	0.0
5	Eriskay	354.2	182812.0	660695.0	90.6	0.0
6	Tigh Nan Cnoc	330.0	182608.0	660740.0	77.6	0.0
7	(Unnamed Dwelling)	352.9	182834.0	661419.0	47.8	0.0
8	Tigh Na Cuilce	442.2	182699.0	661594.0	29.7	0.0
9	Arivore Lodge (Landowner)	389.3	182346.0	660861.0	59.1	0.0
10	The Dorrán	415.9	182453.0	660742.0	70.4	0.0
11	Home Farm	534.8	182061.0	661075.0	37.0	0.0
12	Glenreasdell House	522.0	182295.0	660734.0	62.4	0.0
13	Arivore Cottage	418.7	182498.0	660701.0	73.9	0.0
14	An-Conceas	518.7	182488.0	661675.0	17.4	0.0
15	Bluebell Cottages	593.6	182453.0	661744.0	12.7	0.0
16	Allt Na Feidh	656.1	182327.0	661768.0	12.8	0.0
17	The Rhinns	683.4	182305.0	661788.0	12.3	0.0

Table 7 - Project: Arivore - Dwellings



5 Project: Arivore - Dwellings noise

Dwelling ID	Noise prediction (dB(A))	Noise limit type	Absolute noise limit (dB(A))	Relative to background noise limit (dB(A))	Background noise reference ID
1	22.93	Absolute	35.00	Not applicable	Not applicable
2	21.36	Absolute	35.00	Not applicable	Not applicable
3	21.42	Absolute	35.00	Not applicable	Not applicable
4	31.13	Absolute	35.00	Not applicable	Not applicable
5	33.80	Absolute	35.00	Not applicable	Not applicable
6	34.99	Absolute	35.00	Not applicable	Not applicable
7	34.91	Absolute	35.00	Not applicable	Not applicable
8	31.90	Absolute	35.00	Not applicable	Not applicable
9	33.82	Absolute	45.00	Not applicable	Not applicable
10	33.33	Absolute	35.00	Not applicable	Not applicable
11	29.76	Absolute	35.00	Not applicable	Not applicable
12	30.99	Absolute	35.00	Not applicable	Not applicable
13	32.99	Absolute	35.00	Not applicable	Not applicable
14	29.94	Absolute	35.00	Not applicable	Not applicable
15	28.54	Absolute	35.00	Not applicable	Not applicable
16	27.47	Absolute	35.00	Not applicable	Not applicable
17	27.06	Absolute	35.00	Not applicable	Not applicable

Table 8 - Project: Arivore - Dwellings noise

6 Summary

Noise Prediction Calculation carried out on WindFarmer (GL Garrad Hassan) Version 4.2.20.0 based on the Complex ISO9613-2:1996(E) General model, in accordance with ETSU-R-97.

Overall Sound Power Level to be used for turbine is weighted sound level (LW_{Aref}) of 90.6 dB plus (1.6dB(A) multiplied by a factor of 1.645 (in accordance with IEC 61400 part 14) uncertainty = 93.232dB(A) total for the Endurance E-3120. These levels are confirmed in the Hays Mackenzie Report HM:2300/R1 (6th April 2011) in table 5, page 9 and for uncertainty, table 7 on page 12 of the same report. This section also confirms that the above measurements result at a wind speed 8m/s.

In order to be in compliance with paragraph 25 of the executive summary of ETSU-R-97 (where it is confirmed that a 10m/s wind speed is to be tested), we have had to extrapolate an extra 3.7dB(A) (1.85dB(A) increase for every extra 1m/s – as per table 5, page 9 of the Hays Mackenzie Report. This gives us a final overall Sound Power Level of 96.9dB(A) – i.e. $90.6 + 2.632 + 3.7$ dB(A).

To allow this penalty to be used with the Complex (ISO9613) General method of calculation (which requires the sound to be attenuated as an octave spread) we have added the required 6.3dB to every Octave Sound Power value specified in the above test documents' octave table – which, when added, arrives at the overall Sound Power Level (SPL) of 95.9dB.

Please note we have included a ground attenuation factor of 0.5 (guidance published in the March/April 2009 IOA bulletin suggests that the ISO 9613 method for predicting noise from wind turbines gives a more accurate result when either hard ground $G=0$ or semi porous $G=0.5$ ground attenuation factors are used) – we have used a porous ground effect in the calculations above. We have included a satellite image of the site and surroundings in support of this confirmation of porous ground.

We confirm that all the above Sound Levels and calculations are dB(A)_{eq}, and we have taken 2dB reduction in to account at all the dwellings for the conversion between the LA_{eq} and LA₉₀, 10min descriptors. This LA₉₀, 10min descriptor is required to be in accordance with paragraph 14 of the executive summary of ETSU-R-97.

We have also included the Hays Mackenzie Report HM:2300/R1 (6th April 2011) .

PAN45 / ETSU-R-97 states that an acceptable sound pressure level received at the exterior of a neighbouring noise sensitive property must be no greater than 35dB during daylight hours.

From the above results, it is clear that we do not surpass these levels at any neighbouring non-financially involved property.

HAYES MCKENZIE

PARTNERSHIP



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Endurance E-3120 Wind Turbine Acoustic Performance Test

Report HM: 2300/R1

6th April 2011

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ENDURANCE E-3120 WIND TURBINE

ACOUSTIC PERFORMANCE TEST

Report HM : 2300/R1

6th April 2011

Final Version

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1. Introduction

- 1.1 A turbine noise performance test has been carried out on a Endurance E-3120 wind turbine at East Ash Farm located approximately 2.5km NNE of Bradworthy, Devon, in the UK.
- 1.2 The turbine has a hub height of 25m and a downwind rotor with a diameter of 19.2m. The wind turbine is passive stall regulated and has a rated power of 50 kW, which is achieved at a wind speed of approximately 9.5 m/s at hub height.
- 1.3 The objective of this test was to measure the noise performance characteristics of the wind turbine. The test consisted of measurement of the sound power level and tonal characteristics.
- 1.4 This noise test was conducted in accordance with IEC 61400-11 (2006) *Wind Turbine Generator Systems – Part 11: Acoustic Noise Measurement Techniques*.
- 1.5 The noise measurements were carried out on 1st and 2nd February 2011.
- 1.6 Analysis of the data was carried out according to Method 2: *determination of wind speed with an anemometer* described in IEC 61400-11, as it was not possible to derive the wind speed from the power output of the turbine.



2. Turbine Specification

2.1 The wind turbine is a three-bladed, passive stall regulated (constant speed) downwind turbine. The turbine's specification, as required by IEC 61400-11 and supplied by the manufacturer, is shown in Table 1 below.

Table 1 - Turbine Specifications

Parameter	Value/Feature
Manufacturer	Endurance Wind Power
Model Number	E-3120
Serial Number	EWP-E-01-00123
Type (upwind/downwind)	Downwind, horizontal axis
Hub Height	25m
Rotor Diameter	19.2m
Tower Type	Free-standing Monopole
Turbine Control (stall/pitch)	Passive stall
Rotational Speed	Constant, 43 rpm
Rated Power	50 kW (at 9.5 m/s at rotor centre)
Cut-in Wind Speed	3.5 m/s
Cut-out Wind Speed	25 m/s
Control Software Version	PLC Phoenix Contact - PLC Code version 1.4.11
Rotor Control Devices	Full blade pitching (centrifugally activated)
Blade Type	Fibreglass / epoxy
Number of Blades	3
Gearbox Manufacturer	Flender
Gearbox Type	3 parallel stages
Generator Manufacturer	ABB
Generator Rotational Speed	1500 rpm



3. Measurement

Site Layout and Measurement Position

- 3.1 The site layout is shown at Appendix A. The site was characterised as open farmland bordered by hedgerows, which includes occasional trees. The E-3120 turbine which was the subject of these tests is the only wind turbine on this site.
- 3.2 IEC 61400-11 (2006) *Wind Turbine Generator Systems – Part 11: Acoustic Noise Measurement Techniques* [1] specifies that the microphone used for the noise tests is to be mounted on a 1 m diameter ground-mounted board, facing in the direction of the wind turbine under test, at a distance corresponding to the tip height of the turbine (+/- 20%) directly downwind of the turbine. According to [1], measured noise data is valid as long as the board is within the downwind sector (i.e. +/- 15° of the directly downwind direction). Photos of the noise monitoring equipment set up are shown at Appendix B.
- 3.3 The microphone was fitted inside a primary hemispherical open cell foam wind shield of 90 mm in diameter laid flat on the board. The primary wind shield was surrounded by a secondary hemispherical foam wind shield of 450 mm diameter and 50 mm thickness. The insertion loss of the secondary wind shield is shown at Appendix C. The ground board was 20mm plywood with a diameter of 1000mm.
- 3.4 An anemometer was positioned approximately 45m upwind of the rotor of the turbine to measure wind speed. This is within the 2 to 4 D range specified by IEC 61400-11, where D is the rotor diameter of the wind turbine (here D = 19.2 m). Wind speed values are valid as long as the anemometer position is within the upwind sector (i.e. +/- 30° of the directly upwind direction), and the anemometer was moved during the survey to ensure that it was within allowable tolerances.
- 3.5 Wind speed and wind direction measurements, time-synchronised to the noise measurements, were made using a Second Wind C3 anemometer and an NRG #200P wind vane mounted at 10 m height connected to a Nomad 2 GSM data logger.
- 3.6 The microphone and the met mast position were within the acceptable ranges relative to the position of the nacelle, specified by IEC 61400-11 as discussed at paragraph 3.2, throughout the whole measurement period.



- 3.7 Table 2 details the measurement positions. $R_{0,i}$ is the reference distance on each measurement day and is the horizontal distance from the microphone to the nacelle. R_1 is the resultant slant distance from the measurement position to the nacelle.

Table 2 - Distances and Reference Values

Parameter	Symbol	Value
Hub Height	H	25.3 m ¹
Rotor Diameter	D	19.2 m
Reference Distance day 1	$R_{0,1}$	31.5 m
Reference Distance day 2	$R_{0,2}$	31.5 m
Slant Distance day 1	R_1	40.4 m
Slant Distance day 2	R_2	40.4 m
Reference Roughness Length	z_{0ref}	0.05 m
Anemometer Height	z	10 m

- 3.8 During the noise tests the wind turbine was shut down for certain periods to allow for background noise measurements in order to establish the level of contribution from other noise sources.
- 3.9 Whilst on site, the average 1-minute electrical power output of the turbine was noted down from the turbine operational data once a minute during noise measurements; although at present there is not a power curve available to determine the 10m-height wind speed from the power output. Method 2 described in IEC 61400-11 has therefore been used to determine the sound power level output of the turbine. It would be possible to re-analyse the data with wind speed derived from the electrical power output of the turbine once a power curve (measured according to IEC 61400-12) is available for this turbine.
- 3.10 Amendment 1 (2006) to IEC 61400-11 states that where the hub height is lower than 30m, wind speed may be taken from an anemometer between 10m and hub height.

¹ Including concrete base



4. Instrumentation

4.1 Noise measurements were carried out using the following equipment:

General

Bruel & Kjør Type 4231 calibrator (Serial No. 2218188)

Reference Position

01dB Symphonie Measurement System (Serial No. 00587)

PCB Microphone (Serial No. 377A02)

G.R.A.S. Type 26AK Pre-Amplifier (Serial No. 22826)

Secondary Windshield – Performance detailed at Appendix C

4.2 Meteorological measurements were carried out using the following equipment:

Logger

Second Wind Nomad II (S/N 05587)

Anemometer and Wind Vane

Second Wind C3 Anemometer (S/N 05531)

NRG #200P Wind Vane (S/N AV1102)

Temperature and Pressure Sensors

Second Wind Thermistor Temperature Probe (S/N TH84)

Setra Model 276 Barometric Pressure Sensor (S/N 4404452)

4.3 The noise measurement equipment was field calibrated prior to each measurement being performed and checked at the end. There was no recorded drift in the calibration of the equipment for any measurements. All equipment was within its laboratory calibration period.

4.4 Noise and wind measurements were time-synchronised to GMT, and all measurements were averaged over one minute, with the exception of the air pressure which was sampled every one minute.

Non-Acoustic Data

4.5 Table 3 below details the non-acoustic data reported as required by IEC 61400-11.

**Table 3 – Non-acoustic Data**

Wind speed determination method	Measured 10m height
Roughness length	0.05m
Air temperature, day 1	5.9 - 9.1°C
Air temperature, day 2	6.3 - 9.5 °C
Atmospheric pressure, day 1	1000.0 – 1002.0 mB
Atmospheric pressure, day 2	995.6 – 999.5 mB
Wind direction range, day 1	254.4 – 332.7°
Wind direction range, day 2	238.0 – 280.7°

5. Results

Measured Noise Levels

- 5.1 The measured 1-minute average L_{Aeq} noise data was plotted against the measured average 1-minute 10m height wind speed for operational periods and separately for shutdown periods. All noise data has been filtered such that any 1-minute period that was affected by specific extraneous noises such as vehicles passing on local roads, and any other anomalies, have been removed from the assessment.
- 5.2 Appendix D shows the measured operational noise and measured background noise at the microphone position, plotted against the measured 10m-height wind speed. Table 4 below details the number of operational data points in each wind speed range measured over the 2 days.
- 5.3 Appendix D also shows the measured 1-minute average L_{Aeq} noise data was plotted against electrical power output of the turbine.

Table 4 – Number of 1-minute Noise Data Points Recorded per Wind Speed Bin

Period		2	3	4	5	6	7	8	9	10	11	12	Total
1 st February 2011	Turbine Operational	2	33	31	16	14	1	0	0	0	0	0	97
	Background Noise	0	14	20	10	2	0	0	0	0	0	0	46
2 nd February 2011	Turbine Operational	0	0	0	1	12	20	19	9	16	12	5	94
	Background Noise	0	0	0	0	5	13	7	9	4	8	5	51
Totals	Turbine Operational	2	33	31	17	26	21	19	9	16	12	5	191
	Background Noise	0	14	20	10	7	13	7	9	4	8	5	97



Calculation of $L_{WA,k}$

5.4 IEC 61400-11 requires that a 4th order regression line is plotted through the measured operational data. A 3rd order polynomial regression line has been plotted through the turbine shutdown noise data, as it fits the data better than a 4th order regression line.

5.5 The $L_{WA,k}$ has been calculated using the formula below specified in IEC 61400-11. A correction has been applied to account for secondary wind shield, which has been calculated from the measured 1/3 octave band levels across wind speeds from 3-12 m/s.

$$L_{WA,k} = L_{Aeq,c,k} - 6 + lg \left[\frac{4\pi R_1^2}{S_0} \right]$$

Where

$L_{Aeq,c,k}$ is the background corrected A-weighted sound pressure level at the integer wind speeds and under reference conditions

R_1 is the slant distance in meters from the rotor centre to the microphone as shown

S_0 is a reference area, $S_0 = 1\text{m}^2$

5.6 The results are plotted at Appendix E and in tabular form below at Table 5. Note that the results shown at Appendix E are not corrected for the presence of the secondary wind shield.

Table 5 - Calculation of Sound Power Level using 4th Order Regression Line

10m-height wind speed (m/s)	3	4	5	6	7	8	9	10	11	12
Total Measured Operational Noise Levels (dB L_{Aeq})	49.8	50.1	50.3	50.8	51.8	53.4	55.4	57.3	58.6	58.6
Background Noise Level (dB L_{Aeq})	35.9	35.8	36.6	38.2	40.3	42.9	45.8	48.6	51.4	53.8
Difference Between Total and Background Noise (dB)	13.9	14.3	13.7	12.6	11.5	10.5	9.6	8.7	7.3	4.8
Background Corrected Sound Pressure Level, $L_{Aeq,c,k}$ (dB L_{Aeq})	49.6	49.9	50.1	50.5	51.5	53.0	54.9	56.7	57.7	57.3
Secondary Wind Shield Correction	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Apparent Sound Power Level, $L_{WA,k}$ (dB L_{WA})	87.1	87.3	87.6	88.1	89.0	90.6	92.4	94.3	95.4	94.9*



5.7 It should be noted that the difference between the total measured noise and measured turbine shutdown noise levels at 12m/s is less than 6dB. Therefore 1.3dB has been subtracted from the measured turbine noise as required by IEC 61400-11 and the result marked with an '*'.

1/3 Octave Band Data

5.8 As required by IEC 61400-11, the three one minute average periods closest to each integer wind speed have been used to calculate the energy average 1/3 octave band spectra between 20 and 10kHz for the operational turbine noise. The average background noise spectra have also been calculated from the nearest three nearest 1-minute average background noise periods closest to each integer wind speed. The results are plotted at Appendix F, which also shows the octave band levels. The data has been corrected for the insertion loss of the secondary wind shield.

5.9 It should be noted that there were only two 1-minute periods available for the operational wind speed of 12m/s. It should also be noted that only two 1-minute periods were available for the shutdown periods wind speed of 6, 8, and 10 m/s, and no data available for a wind speed of 7m/s.

5.10 The sound power level has been calculated for wind speeds for 6-8m/s as required by IEC 61400-11 for each 1/3 octave as measured and the results are shown in Appendix G, which also shows the octave band levels. The operational turbine noise spectra have been corrected for the presence of background noise by subtracting the average background noise. Note that the 6m/s background noise has been subtracted from the 7m/s spectrum as there was no background noise data for 7m/s. Where the difference between the measured turbine noise and measured background noise levels is less than 6dB the measured turbine noise has been corrected for background noise by subtracting 1.3dB as required by IEC 61400-11 and the result marked with an '*'.

5.11 It should be noted that it has not been possible to calculate the 1/3 octave sound power levels for wind speeds above 8m/s due to the influence of background noise.

Narrow Band Analysis

5.12 The presence of tones has been determined for wind speeds of 6-10 m/s following the procedure set out in IEC 61400-11, with the results presented at Appendix H. Note that the data has not been A-weighted or corrected for the insertion loss of the secondary wind shield.



5.13 The results of the narrow band analysis identified the presence of tones at 6m/s wind speed. No tones were identified at any other wind speed.

6. Other Acoustic Characteristics

6.1 The operational noise from the turbine can be characterised by aerodynamic noise from the blades rotating, together with a mechanical component from the gearbox.

6.2 It should be noted that the wind turbine tower is fitted with an external ladder and safety line. At wind speeds above about 8m/s a tonal noise was noted during the background noise measurements due to wind passing the ladder and safety line. This can be seen on the narrowband analysis charts shown Appendix H for wind speeds of 8-10 m/s at frequencies of 840 and 1015 Hz.

6.3 An audible pulse was noted from the wind turbine at higher wind speeds as the turbine blades pass the wake caused by wind around the tower. No assessment of impulsivity has been carried out, as it was not deemed significant enough to warrant further analysis.

7. Uncertainty

7.1 An assessment of measurement uncertainty has been carried out, based on the procedure outlined in Annex D of IEC 61400-11, as follows: Type A uncertainties are evaluated from the extent to which the measured values vary around the derived mean based on the regression analysis; Type B uncertainties are a measure of the assumed accuracy of various factors in the measurements procedure and have been based on the factors shown at the Annex D. The total uncertainty U_C is evaluated from the square root of the sum of the squares of each individual component.

7.2 The standard uncertainty of the apparent sound power is calculated in Table 6 using Equation D.1 in Annex D of IEC 61400-11. The total uncertainty of the measured L_{WA} calculated from all uncertainties, as given in Table 7, is ± 1.6 dB for the Reference Position.

**Table 6 - Calculation of L_{WA} Uncertainty U_A**

Number of Elements	191
Standard Error U_A	0.728

Table 7 - Calculation of Uncertainty U_C

Type A Uncertainty	
Standard Error of L_{WA} Estimate from Regression Analysis	0.728
Type B Uncertainty	
Calibration	0.2
Instrument	0.2
Board & Mounting	0.3
Distance	0.2
Impedance	0.1
Turbulence	0.4
Wind Speed Measured	1.2
Background	0.3
Total Uncertainty	
Total, U_C	1.6

8. Conclusions

- 8.1 A noise test has been carried out, according to IEC 61400-11 on an Endurance E-3120 Wind Turbine at East Ash Farm, Bradworthy, Devon, to measure the sound power level and tonal characteristics.
- 8.2 The apparent sound power level of the wind turbine was calculated over a range of wind speeds from 3-12m/s together with the one third octave band levels for wind speeds of 6-8 m/s. It was not possible to calculate the 1/3 octave sound power levels above 8m/s due to the contrition of background noise.
- 8.3 The tonal output from the Endurance E-3120 turbine has been assessed using the methodology prescribed by IEC 61400-11 for wind speeds of 6-10 m/s and has been determined to be not tonal, except at a wind speed of 6m/s where tones were identified.



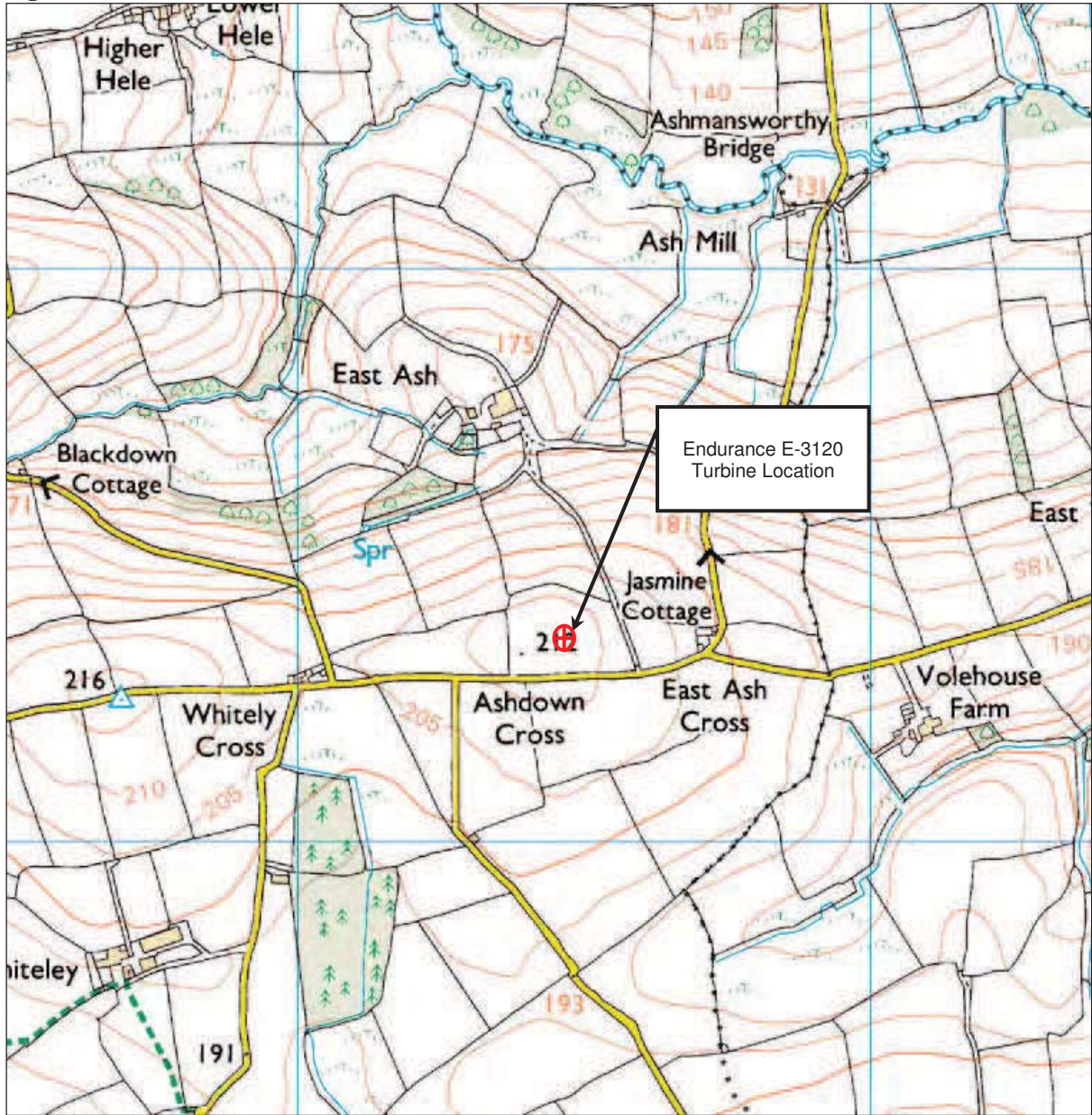
9. References

- [1] BS EN 61400-11 *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*, (Amendment 1 May 2006), International Electrotechnical Commission

Appendix A

Site Layout

Figure A1 – Endurance E-3120 Location



Appendix B

Site Photos

Figure B1 –Photo Showing Turbine and 10m Meteorological Mast



Figure B2 –Photo Showing View of Ground Board from Turbine



Figure B3 –Photo Showing Noise Measurement Location



Figure B4 –Photo Showing Detail of Ground Board Location



Appendix C
Secondary Wind Shield Insertion Loss



TEST REPORT No : MI/04/04

DATE OF ISSUE : 21 September 2004

Page 1 of 6

Measurement of the Insertion Loss of Microphone Windshields

CLIENT: Haynes M^cKenzie Partnership
Lintrathen House
West Dean
Salisbury
SP5 1JL

JOB NUMBER: A04/65

TEST SAMPLE: Double skin tripod mounted and secondary windshields

MANUFACTURER: None specified

DATE RECEIVED: 1 September 2004

DATE OF TEST: 17 September 2004

Signed: 

D J M^cCaul

Laboratory Manager

Approved: 

G Kerry

Technical Manager



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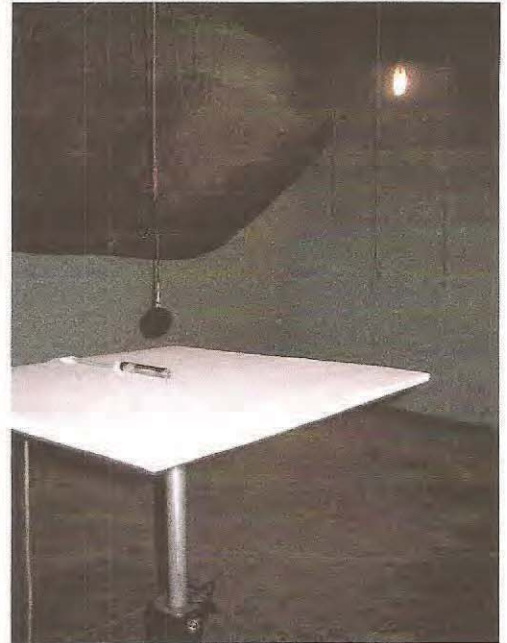
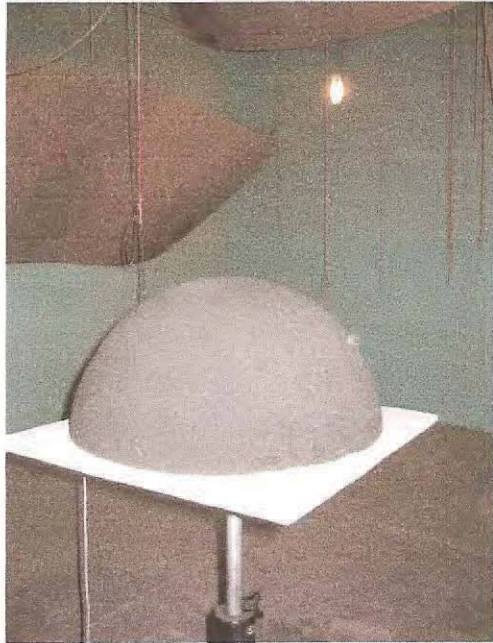
2000

TEST SAMPLES

Description of Test Samples

Test Ref: MI/04/09/03

Secondary windshield, external diameter 450mm, mounted on a section of plasterboard with dimensions: 480mm x 480mm x 12.5mm and weighing 2.5kg.



Test Ref: MI/04/09/04

Double skin tripod mounted windshield, external diameter 120mm.



DESCRIPTION OF TEST PROCEDURE

Description of Test Facility

The tests were carried out in the large reverberation room at the University of Salford. The room has been designed with hard surfaces and non-parallel walls to give long empty room reverberation times with uniform decays. It has the shape of a truncated wedge. In addition 11 plywood panels, each panel 1.22m x 2.44m, were hung in the room to improve the diffusivity of the sound field. The test sample was placed in the centre of the room and >1100mm above the floor of the room. The excitation signal comprised wide band random noise played into the room via a loudspeaker system mounted in a cabinet facing a corner. The room is 7.4m long x ~6.6m wide x 4.5m high. It has a volume of 225m³ and a total surface area of 243m².

Test Procedure

Measurements were made over a frequency range of 20Hz to 20,000Hz in one-third octave bands with and without the test object in place. Measurements were carried out consecutively to avoid significant changes in relative humidity and temperature that influence air absorption at higher frequencies. The measurement period was 60 seconds. The insertion loss of the test object was determined by subtracting the level with the test object in place from the level without the test object in place:

$$\text{insertion loss} = \text{unoccluded} - \text{occluded} \quad (\text{dB})$$

A total of 12 measurements for each situation were taken, six each for two loudspeaker positions. These were then averaged.

3 EQUIPMENT

Item	Departmental Record No.
Norwegian Electronics 1/3 octave band real time analyser type 840 with in-built random noise generator	RTA2
Quad 510 power amplifier	PA7
Bruel &Kjaer microphone power supply type 2804	1848095
2 off broadband loudspeakers	LS3 & LS4
1 off G.R.A.S. random incidence condenser microphones type 40AP in the receiving room	M16
1 off Norsonic Multiplexer type 834A	MP2
HP Brio Pentium personal computer and related peripheral equipment (printer, plotter, monitor etc.)	COM6
Yamaha GQ1031BII graphic equalizer	GEQ1

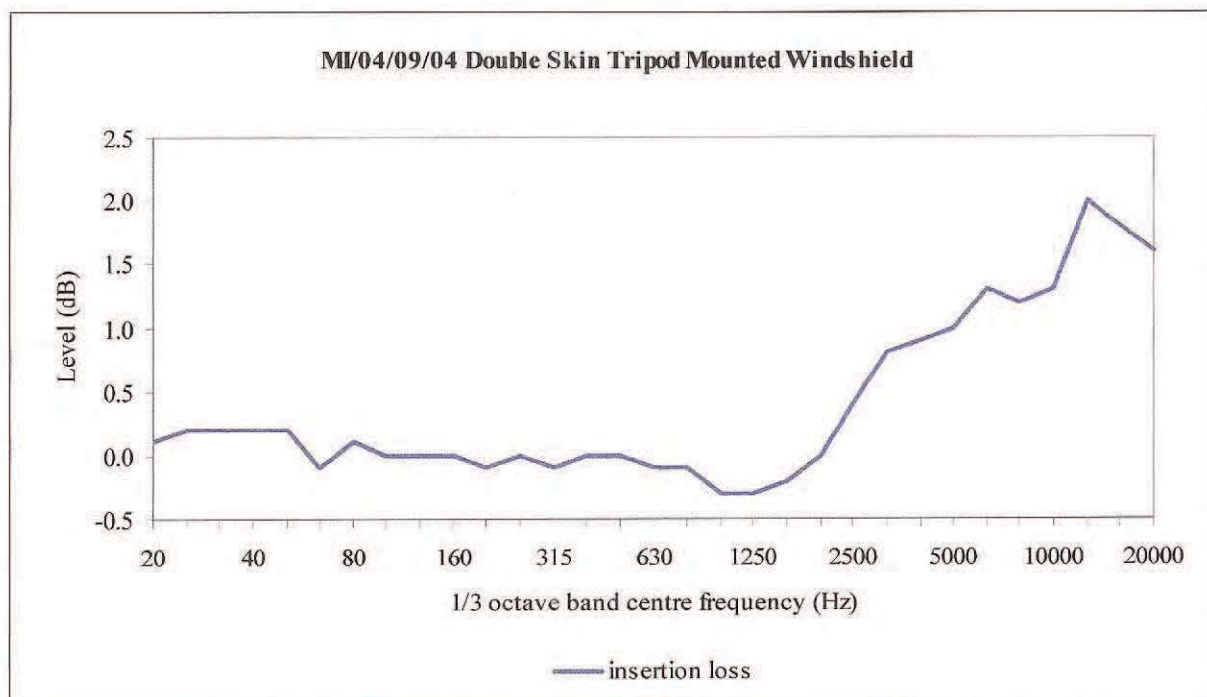
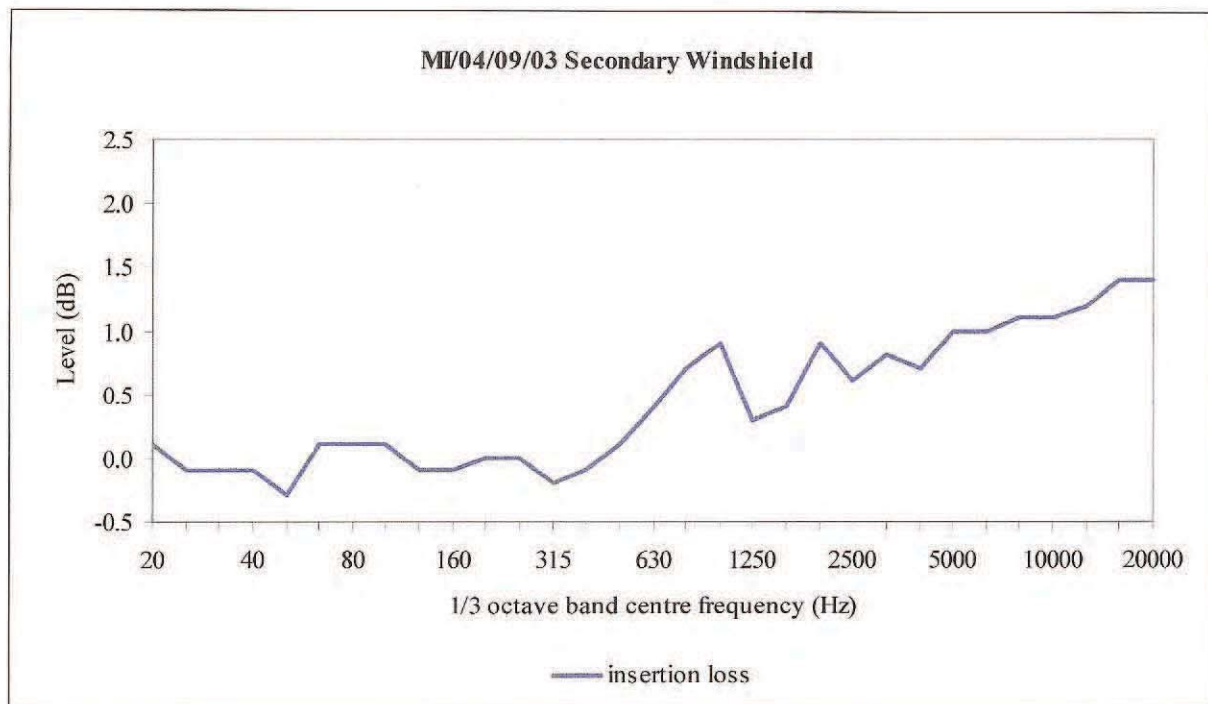
RESULTS

The insertion loss values at one third octave band intervals are given in the tables overleaf.

	MI/04/09/03	MI/04/09/04
Temperature in reverberation room °C:	22.5	22.6
Relative humidity in reverberation room %:	46.6	46.2

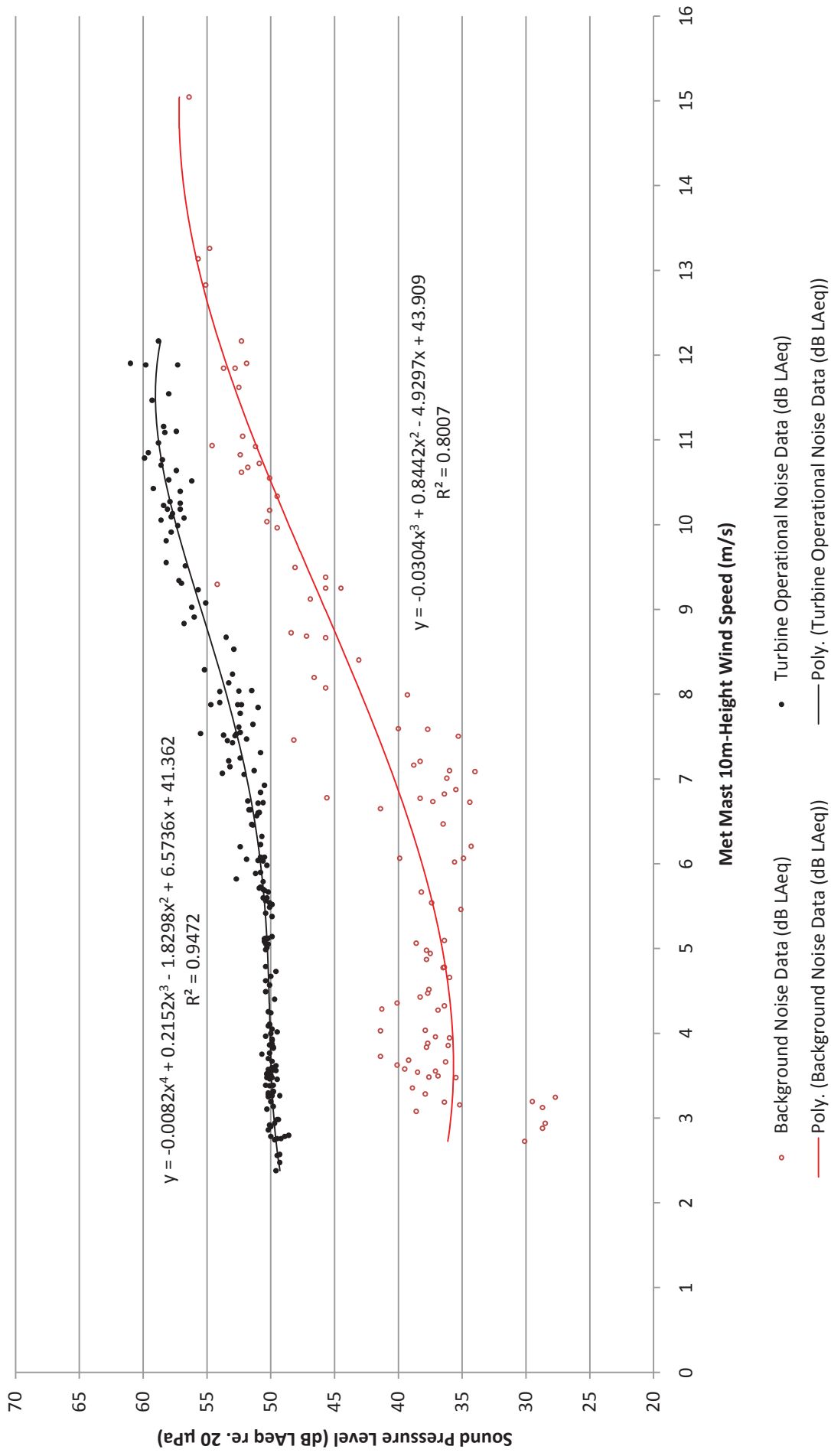
The results here presented relate only to the items tested and described in this report.

I/3 OBCF (Hz)	MI/04/09/03			MI/04/09/04		
	unocc (dB)	occ (dB)	insertion loss (dB)	unocc (dB)	occ (dB)	insertion loss (dB)
20	53.6	53.5	0.1	53.1	53.0	0.1
25	60.2	60.3	-0.1	59.5	59.3	0.2
31.5	74.4	74.5	-0.1	75.1	74.9	0.2
40	79.6	79.7	-0.1	80.1	79.9	0.2
50	79.5	79.8	-0.3	79.7	79.5	0.2
63	80.8	80.7	0.1	81.2	81.3	-0.1
80	78.4	78.3	0.1	78.7	78.6	0.1
100	85.8	85.7	0.1	85.3	85.3	0.0
125	88.9	89.0	-0.1	87.7	87.7	0.0
160	86.0	86.1	-0.1	85.3	85.3	0.0
200	85.8	85.8	0.0	85.6	85.7	-0.1
250	87.7	87.7	0.0	86.3	86.3	0.0
315	88.7	88.9	-0.2	86.1	86.2	-0.1
400	89.1	89.2	-0.1	85.6	85.6	0.0
500	90.2	90.1	0.1	86.9	86.9	0.0
630	89.4	89.0	0.4	86.5	86.6	-0.1
800	88.1	87.4	0.7	85.4	85.5	-0.1
1000	88.6	87.7	0.9	85.9	86.2	-0.3
1250	88.8	88.5	0.3	86.1	86.4	-0.3
1600	88.7	88.3	0.4	86.1	86.3	-0.2
2000	89.5	88.6	0.9	86.7	86.7	0.0
2500	89.2	88.6	0.6	86.7	86.3	0.4
3150	87.9	87.1	0.8	85.9	85.1	0.8
4000	88.9	88.2	0.7	86.2	85.3	0.9
5000	89.1	88.1	1.0	86.5	85.5	1.0
6300	73.1	72.1	1.0	70.8	69.5	1.3
8000	63.1	62.0	1.1	60.9	59.7	1.2
10000	61.2	60.1	1.1	59.4	58.1	1.3
12500	59.7	58.5	1.2	58.4	56.4	2.0
16000	53.8	52.4	1.4	51.4	49.6	1.8
20000	44.4	43.0	1.4	40.3	38.7	1.6

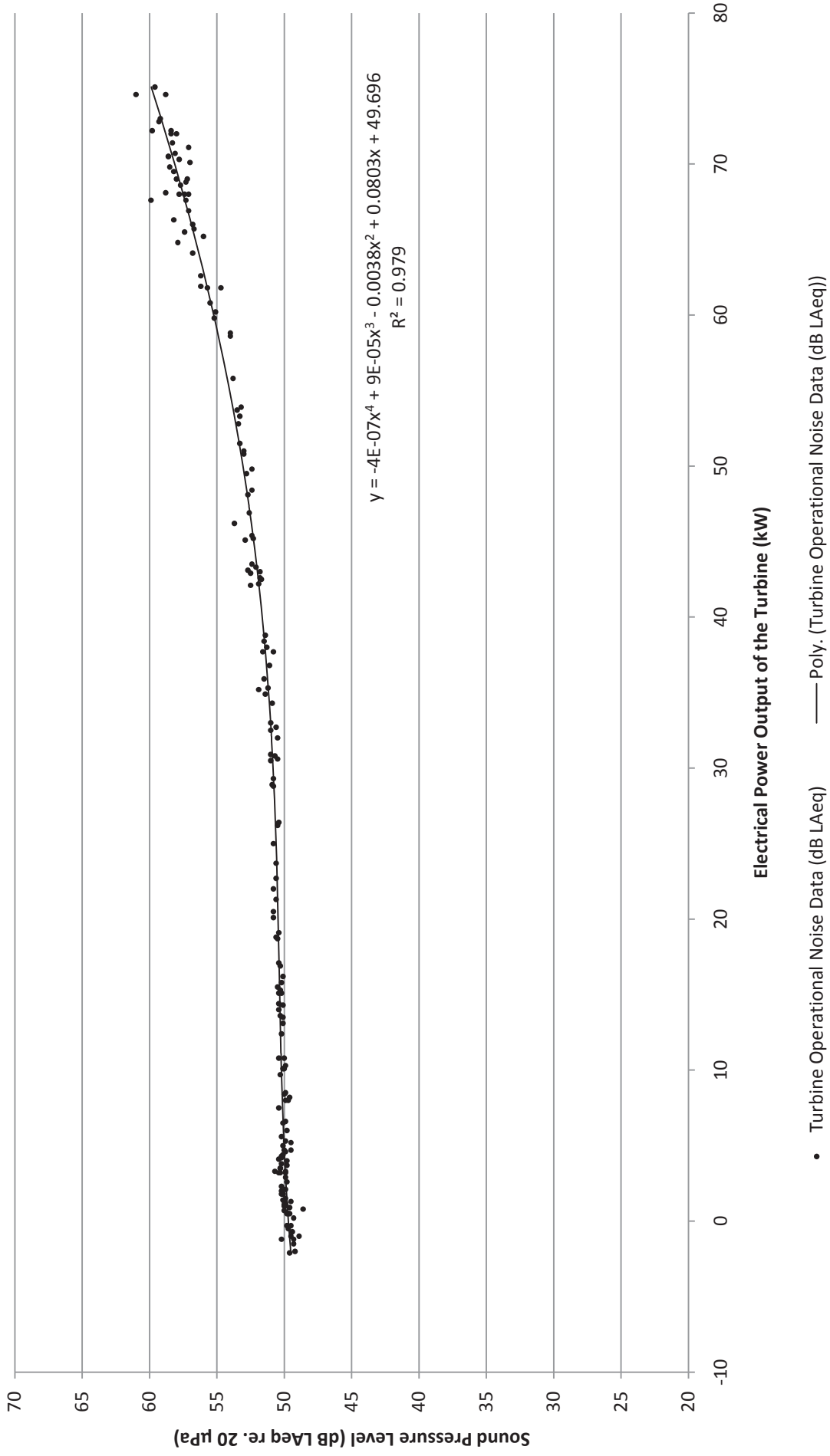


Appendix D
Measured Turbine and Background Data

Endurance E-3120 - Noise Measurements Measured Turbine and Background Noise Levels 1st and 2nd February 2011

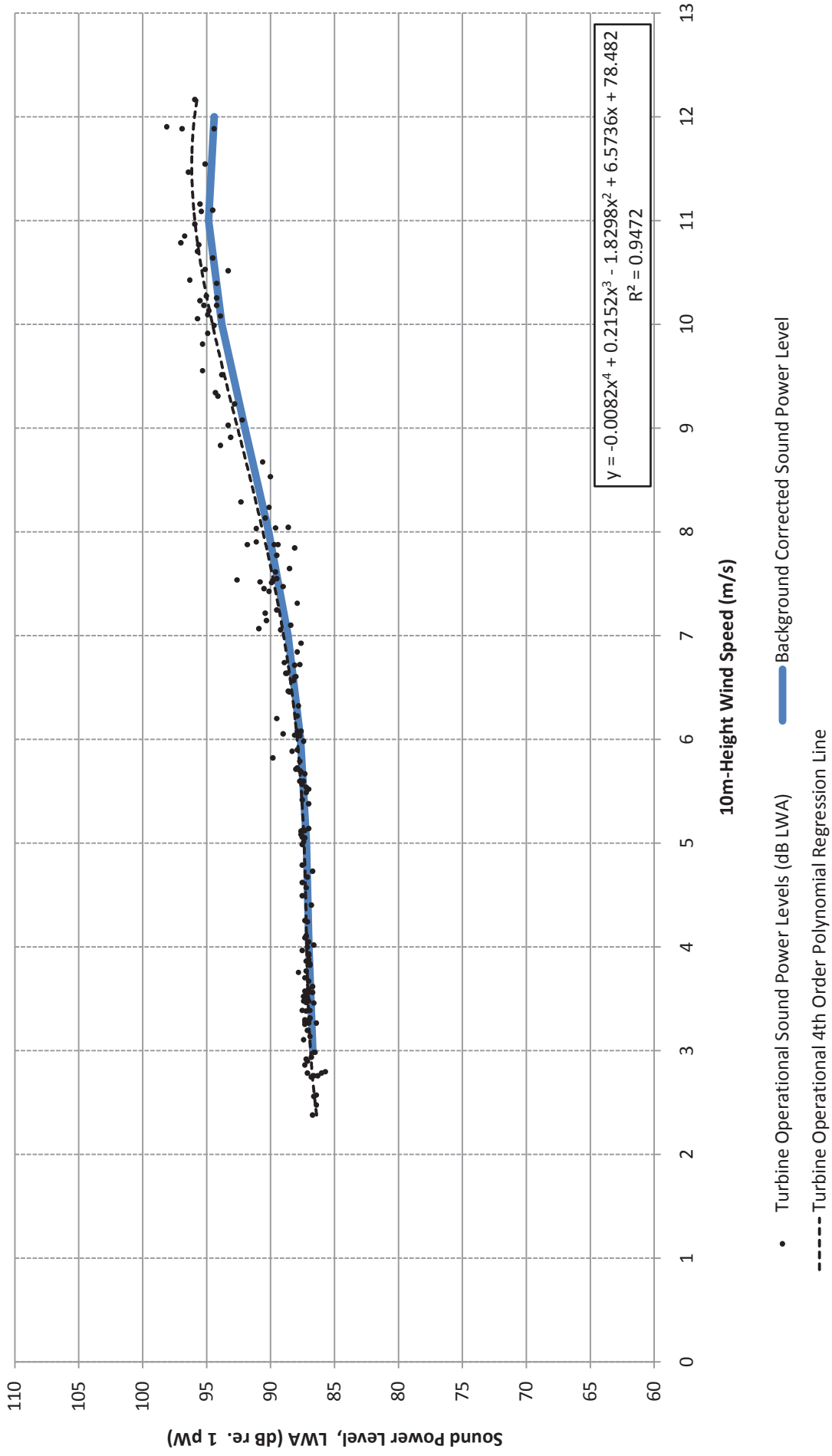


Endurance E-3120 - Noise Measurements Measured Turbine Noise Levels Plotted against Electrical Power Output 1st and 2nd February 2011



Appendix E
Calculation of Sound Power Level

Endurance E-3120 - Noise Measurements Calculated Sound Power Levels 1st and 2nd February 2011



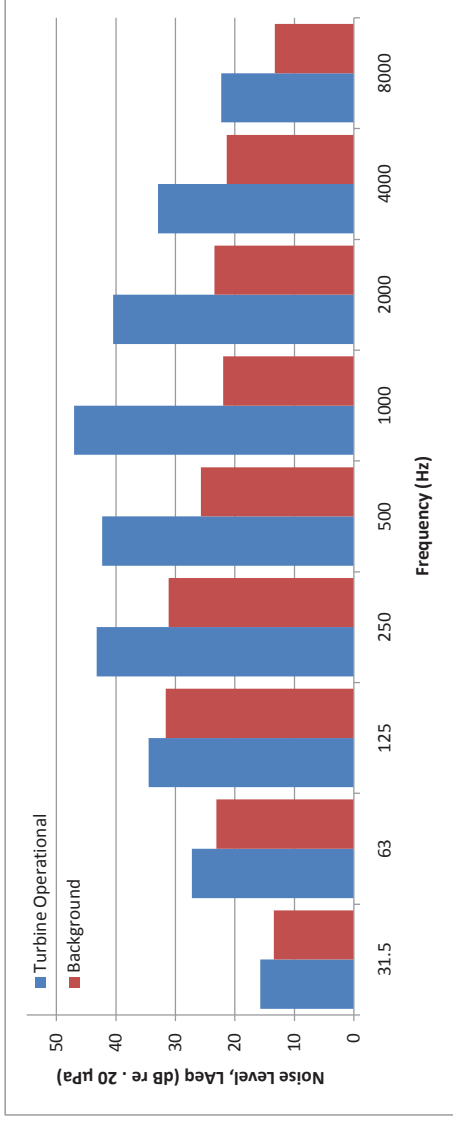
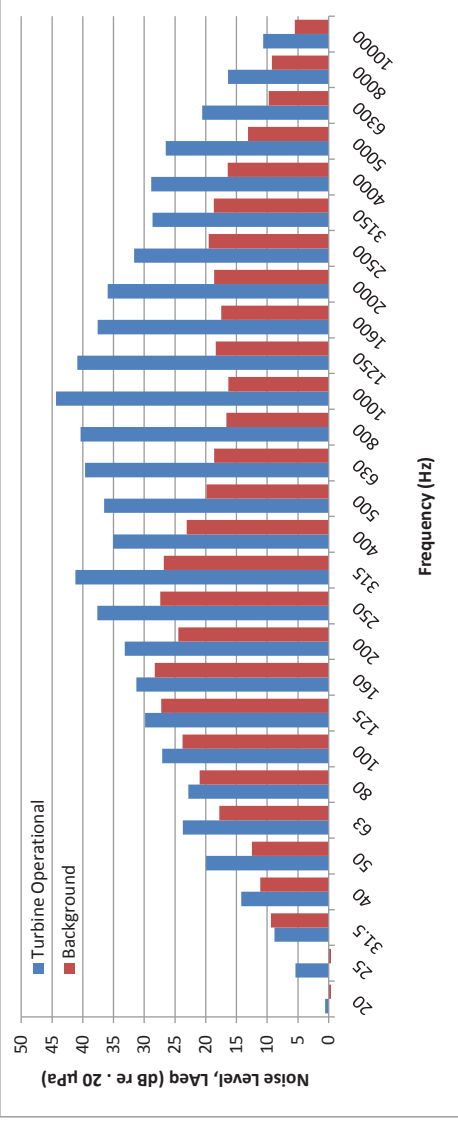
Appendix F
Measured One Third Octave Levels

HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 3 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	0.6		-10.0	
25	5.4		-2.8	
31.5	8.8	15.7	9.4	13.5
40	14.2		11.1	
50	20.0		12.5	
63	23.7	27.2	17.8	23.1
80	22.8		21.0	
100	27.1		23.8	
125	29.9	34.5	27.3	31.6
160	31.3		28.3	
200	33.2		24.5	
250	37.6	43.2	27.4	31.2
315	41.2		26.8	
400	35.1		23.1	
500	36.5	42.3	19.9	25.7
630	39.6		18.6	
800	40.3		16.6	
1000	44.3	47.0	16.3	22.0
1250	40.9		18.4	
1600	37.6		17.5	
2000	36.0	40.5	18.6	23.4
2500	31.6		19.6	
3150	28.7		18.7	
4000	28.9	32.9	16.4	21.4
5000	26.5		13.1	
6300	20.6		9.8	
8000	16.4	22.3	9.2	13.3
10000	10.7		5.5	
Overall	50.2		35.9	

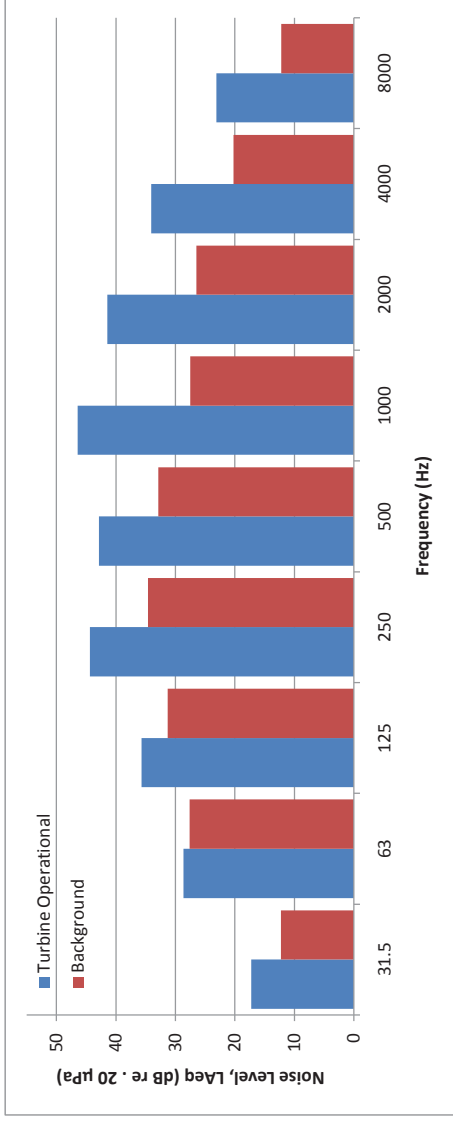
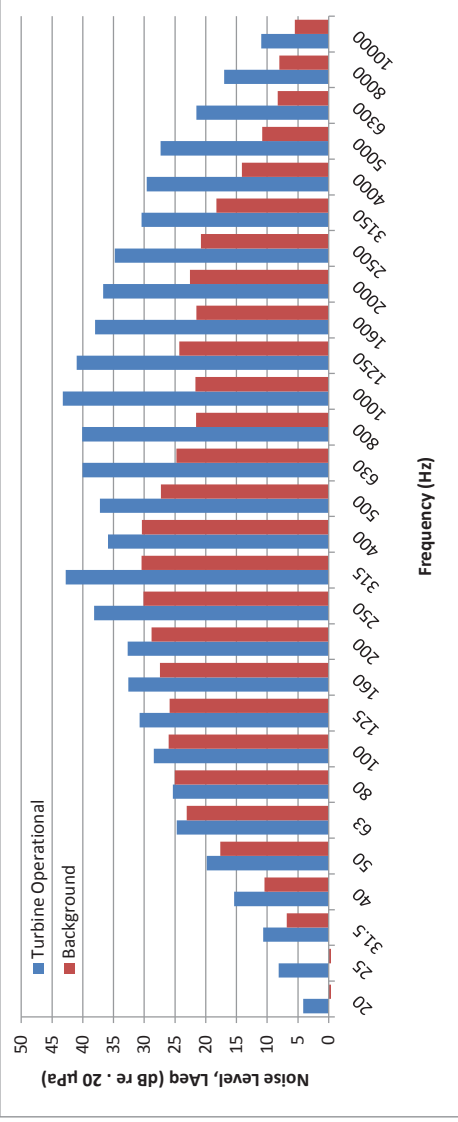


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 4 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	4.2		-9.0	
25	8.1		-1.1	
31.5	10.6	17.2	6.8	12.2
40	15.4		10.5	
50	19.8		17.6	
63	24.7	28.7	23.1	27.6
80	25.4		25.0	
100	28.5		26.1	
125	30.8	35.7	25.9	31.3
160	32.6		27.4	
200	32.7		28.8	
250	38.2	44.4	30.1	34.6
315	42.8		30.5	
400	35.9		30.4	
500	37.2	42.8	27.3	32.9
630	40.0		24.8	
800	40.1		21.6	
1000	43.3	46.4	21.7	27.5
1250	41.0		24.3	
1600	38.0		21.5	
2000	36.7	41.5	22.6	26.5
2500	34.8		20.8	
3150	30.4		18.3	
4000	29.6	34.1	14.1	20.2
5000	27.3		10.8	
6300	21.5		8.3	
8000	17.0	23.1	8.0	12.2
10000	11.0		5.5	
Overall	50.5		39.0	

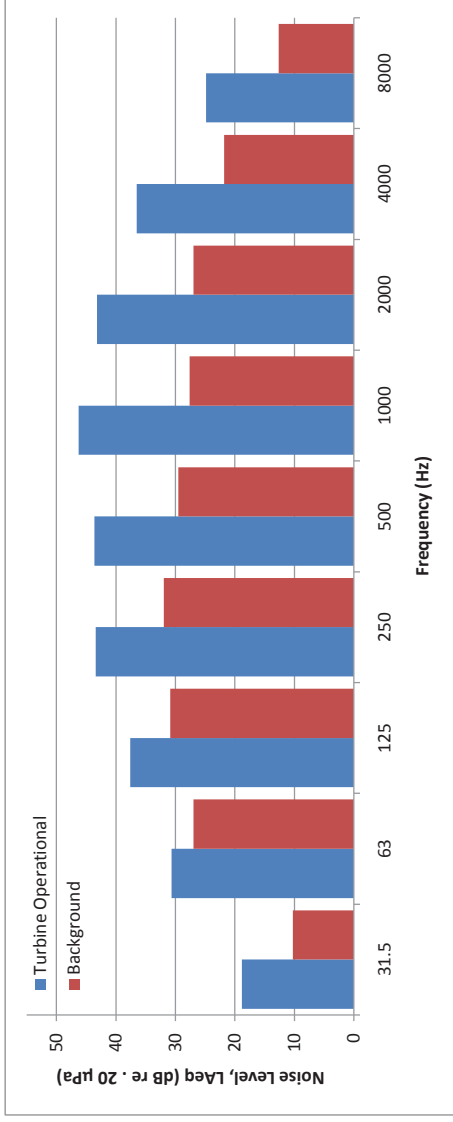
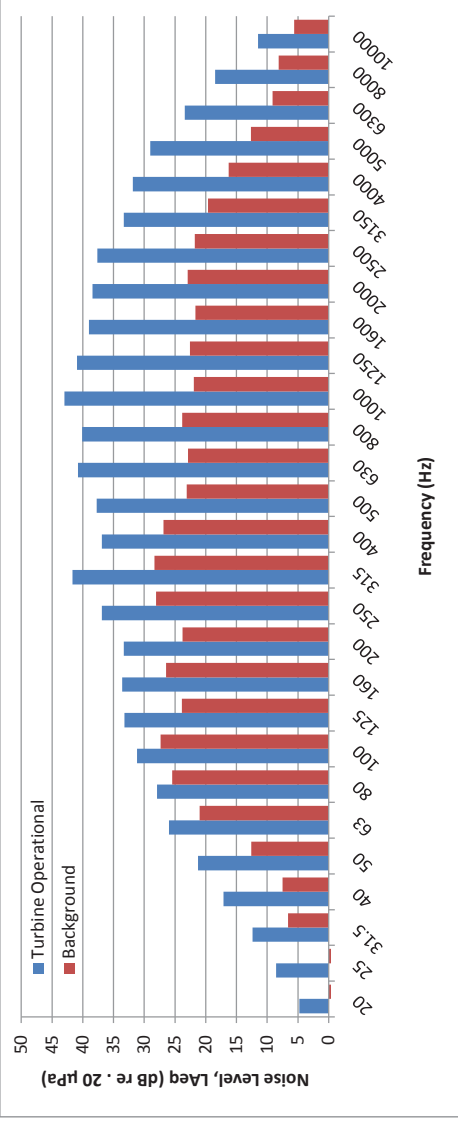


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 5 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	4.8		-10.8	
25	8.5		-4.6	
31.5	12.4	18.8	6.6	10.2
40	17.1		7.5	
50	21.3		12.6	
63	26.0	30.6	21.0	27.0
80	27.9		25.5	
100	31.2		27.3	30.9
125	33.2		23.9	
160	33.6		26.4	
200	33.4		23.8	
250	36.9	43.4	28.1	32.0
315	41.7		28.4	
400	36.9		26.9	
500	37.7		23.1	29.5
630	40.8		22.9	
800	40.1		23.8	
1000	43.0	46.3	22.0	27.6
1250	41.0		22.6	
1600	39.0		21.7	
2000	38.4	43.2	22.9	27.0
2500	37.7		21.8	
3150	33.3		19.6	
4000	31.9	36.5	16.2	21.8
5000	29.0		12.6	
6300	23.4		9.1	
8000	18.5	24.8	8.1	12.6
10000	11.5		5.6	
Overall	50.8		37.4	

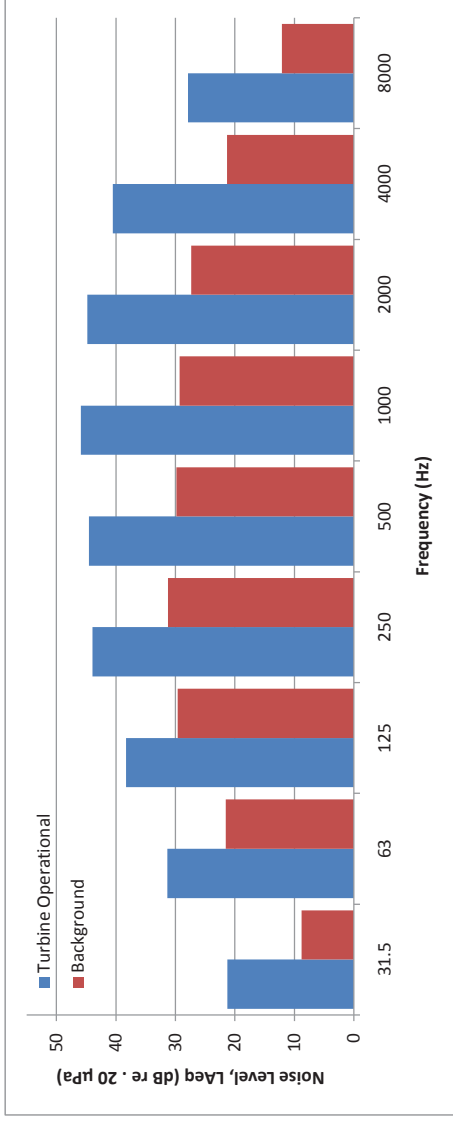
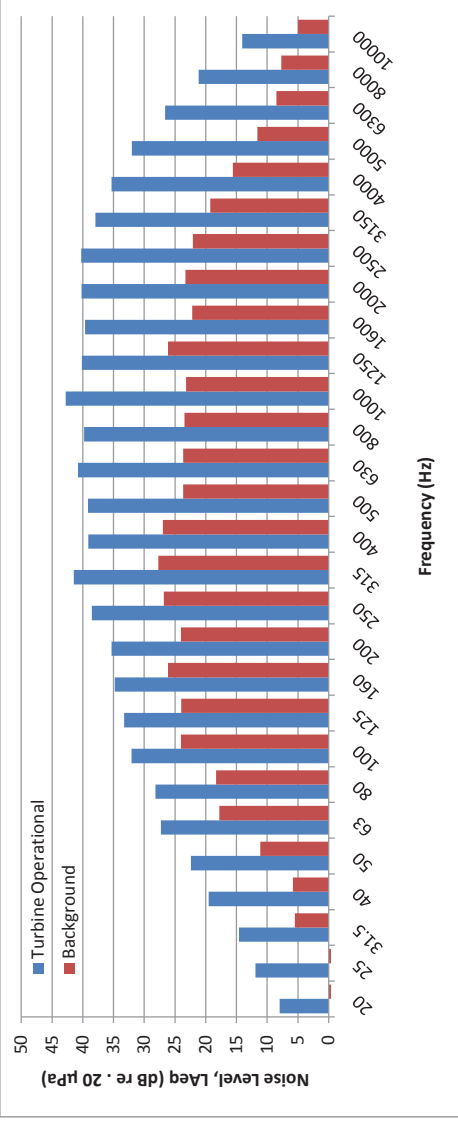


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 6 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	8.0		-12.7	
25	11.9		-6.5	
31.5	14.6	21.3	5.5	8.8
40	19.5		5.8	
50	22.4		11.2	
63	27.3	31.4	17.8	21.5
80	28.2		18.3	
100	32.1		24.0	
125	33.3	38.3	24.0	29.6
160	34.8		26.2	
200	35.3		24.0	
250	38.5	43.9	26.8	31.2
315	41.5		27.0	
400	39.1		27.7	
500	39.1	44.5	23.7	29.8
630	40.8		23.6	
800	39.8		23.5	
1000	42.8	45.9	23.2	29.3
1250	40.1		26.2	
1600	39.7		22.2	
2000	40.2	44.8	23.3	27.3
2500	40.3		22.1	
3150	38.0		19.3	
4000	35.3	40.5	15.6	21.3
5000	32.0		11.6	
6300	26.6		8.5	
8000	21.1	27.9	7.7	12.1
10000	14.1		5.0	
Overall	51.5		36.9	



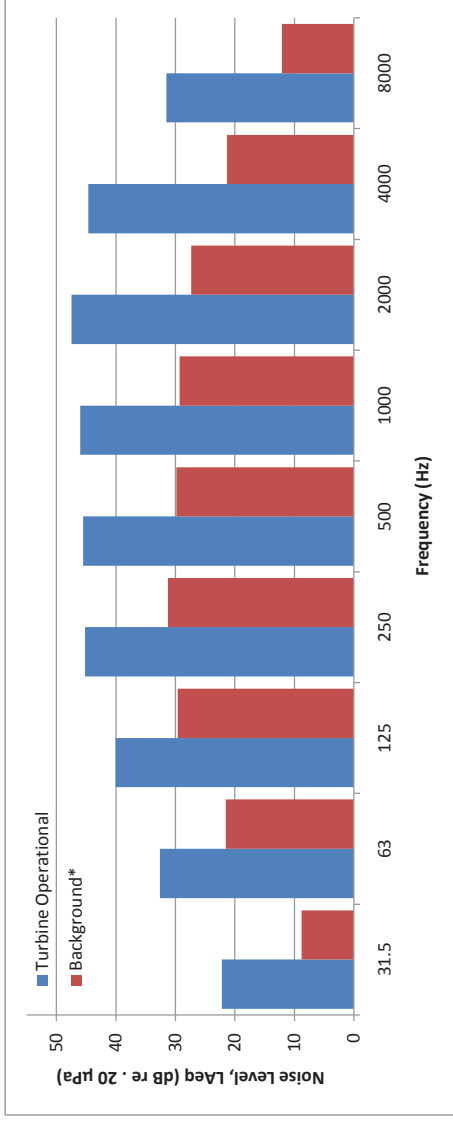
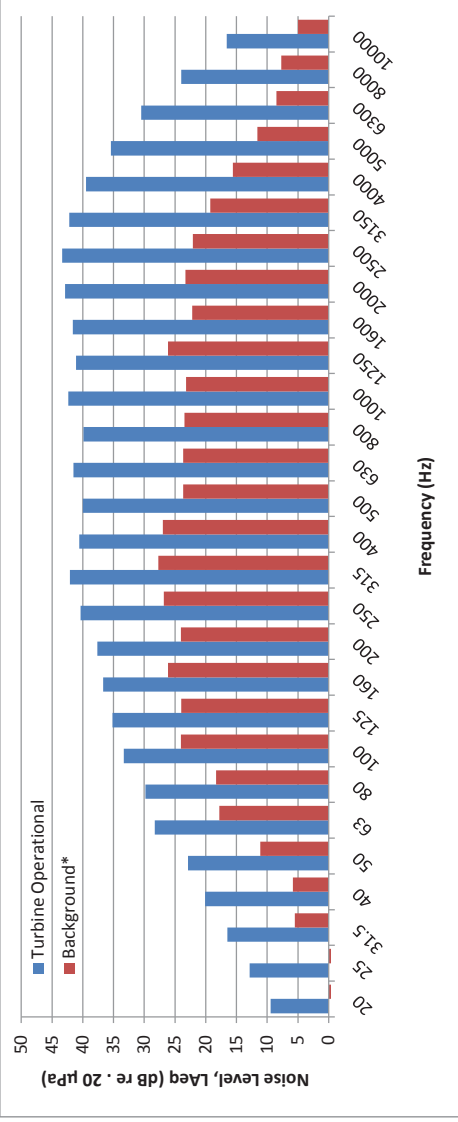
HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 7 m/s



Frequency (Hz)	Turbine Operational		Background*	
	1/3 Octave Band (dB(A))	Octave Band (dB (A))	1/3 Octave Band (dB(A))	Octave Band (dB (A))
20	9.4		-12.7	
25	12.9		-6.5	
31.5	16.5	22.2	5.5	8.8
40	20.1		5.8	
50	22.9		11.2	
63	28.3	32.6	17.8	21.5
80	29.8		18.3	
100	33.3		24.0	
125	35.2	40.0	24.0	29.6
160	36.7		26.2	
200	37.7		24.0	
250	40.4	45.2	26.8	31.2
315	42.1		27.0	
400	40.6		27.7	
500	40.0	45.5	23.7	29.8
630	41.5		23.6	
800	39.9		23.5	
1000	42.4	46.0	23.2	29.3
1250	41.1		26.2	
1600	41.6		22.2	
2000	42.9	47.5	23.3	27.3
2500	43.4		22.1	
3150	42.2		19.3	
4000	39.5	44.6	15.6	21.3
5000	35.4		11.6	
6300	30.5		8.5	
8000	24.0	31.5	7.7	12.1
10000	16.6		5.0	
Overall		53.2		36.9

* Background taken from 6m/s

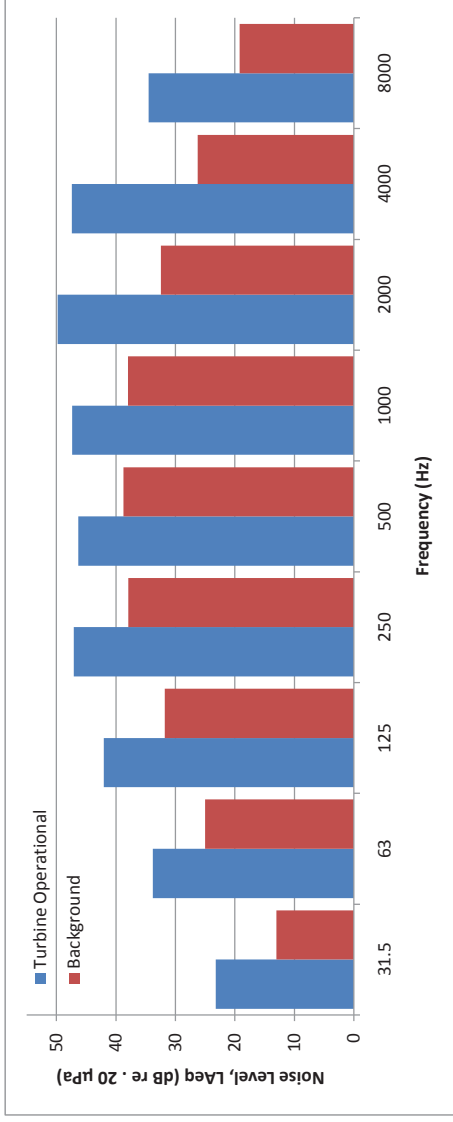
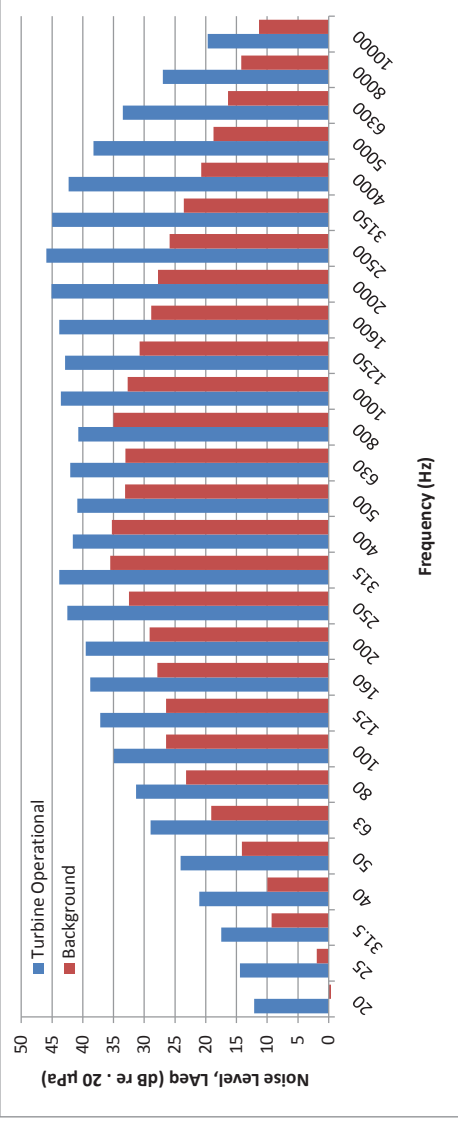


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 8 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	12.1		-1.9	
25	14.5		2.0	
31.5	17.5	23.2	9.3	13.0
40	21.0		10.0	
50	24.1		14.1	
63	29.0	33.8	19.1	25.0
80	31.3		23.2	
100	35.0		26.5	31.8
125	37.2	42.0	26.5	
160	38.8		27.9	
200	39.5		29.2	
250	42.5	47.1	32.5	37.9
315	43.8		35.5	
400	41.6		35.3	
500	40.9	46.3	33.1	38.7
630	42.1		33.1	
800	40.7		35.0	
1000	43.6	47.3	32.7	38.0
1250	42.9		30.8	
1600	43.8		28.9	32.5
2000	45.1	49.8	27.8	
2500	45.9		25.9	
3150	45.0		23.6	26.2
4000	42.3	47.4	20.7	
5000	38.3		18.7	19.2
6300	33.5		16.4	
8000	27.0	34.5	14.2	
10000	19.7		11.3	
Overall	55.1		43.8	

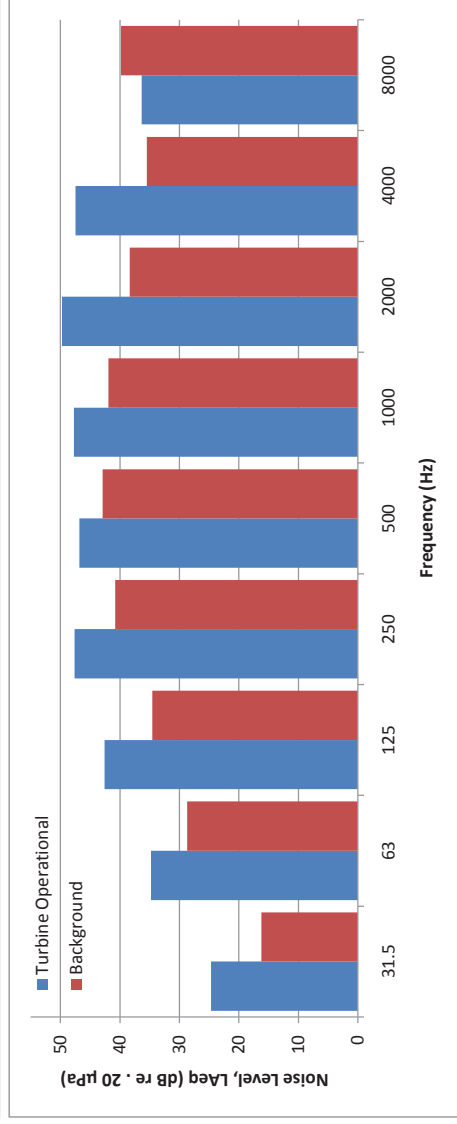
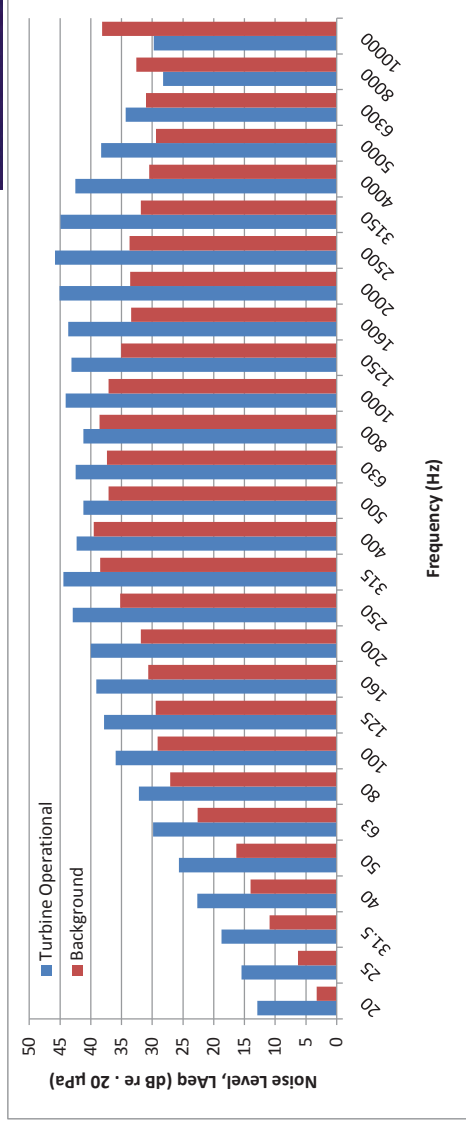


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 9 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	12.9		3.3	
25	15.5		6.3	
31.5	18.7	24.7	10.9	16.2
40	22.7		14.0	
50	25.7		16.3	
63	29.8	34.8	22.6	28.7
80	32.2		27.1	
100	35.9		29.1	34.6
125	37.8	42.6	29.5	
160	39.1		30.6	
200	40.0		31.9	
250	42.9	47.6	35.2	40.8
315	44.5		38.5	
400	42.3		39.5	
500	41.2	46.8	37.1	42.9
630	42.5		37.4	
800	41.2		38.6	
1000	44.1	47.7	37.1	41.9
1250	43.2		35.1	
1600	43.7		33.4	38.4
2000	45.1	49.7	33.6	
2500	45.8		33.7	
3150	44.9		31.9	35.5
4000	42.5	47.5	30.5	
5000	38.3		29.4	39.8
6300	34.3		31.0	
8000	28.2	36.4	32.6	
10000	29.8		38.1	
Overall	55.3		48.5	

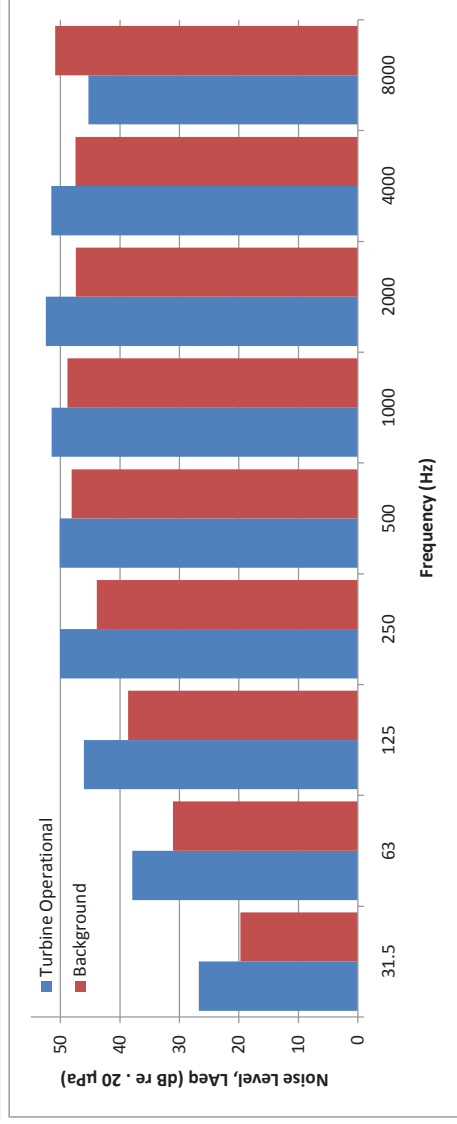
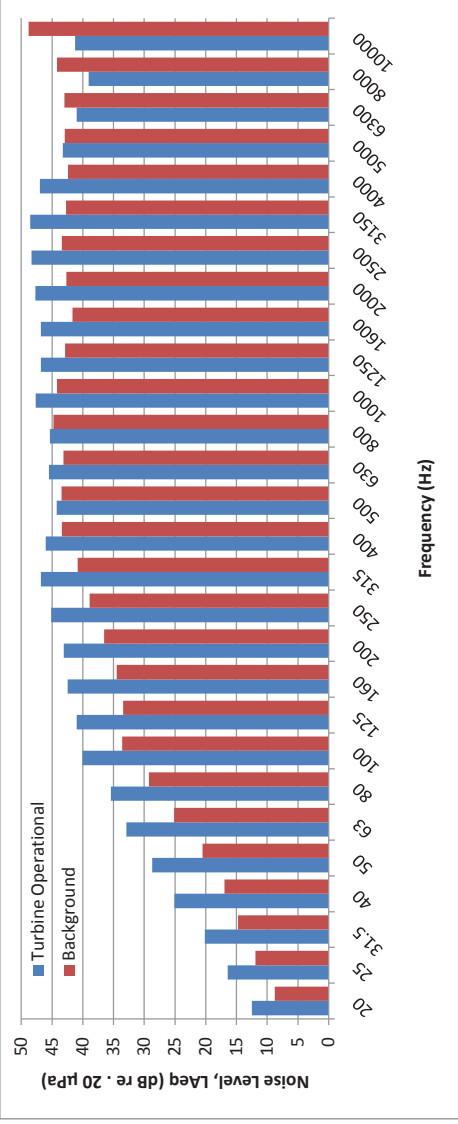


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 10 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	12.5		8.8	
25	16.4		11.9	
31.5	20.1	26.7	14.7	19.8
40	25.1		16.9	
50	28.7		20.5	
63	32.9	37.9	25.2	31.1
80	35.4		29.3	
100	40.0		33.6	
125	41.0	46.0	33.4	38.6
160	42.4		34.5	
200	43.1		36.5	
250	45.2	50.1	38.9	43.9
315	46.8		40.9	
400	46.0		43.4	
500	44.2	50.1	43.5	48.1
630	45.5		43.2	
800	45.4		44.8	
1000	47.7	51.5	44.2	48.8
1250	46.8		42.9	
1600	46.8	52.4	41.7	47.4
2000	47.7		42.7	
2500	48.4		43.4	
3150	48.5		42.7	
4000	47.0	51.5	42.4	47.5
5000	43.2		42.9	
6300	41.0		43.0	
8000	39.1	45.3	44.2	50.9
10000	41.2		48.8	
Overall	58.7		56.1	

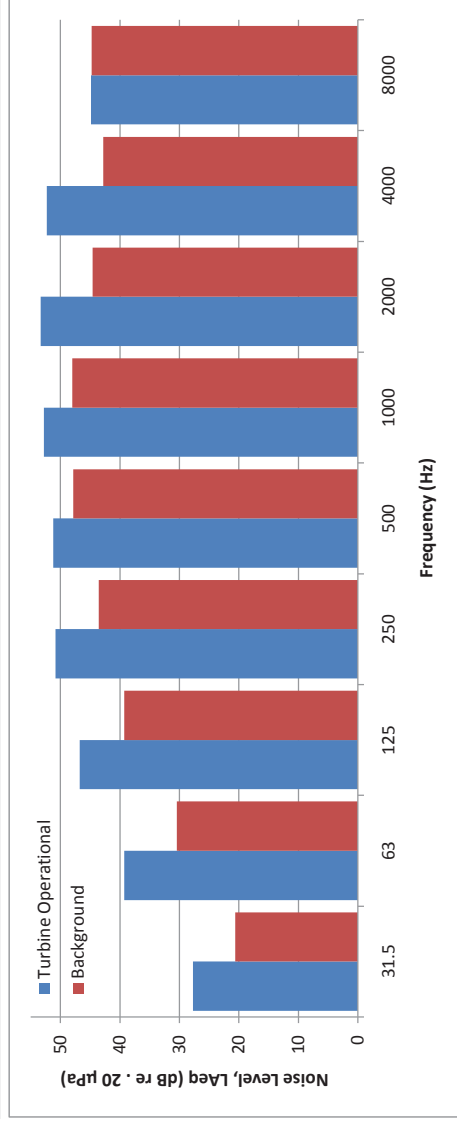
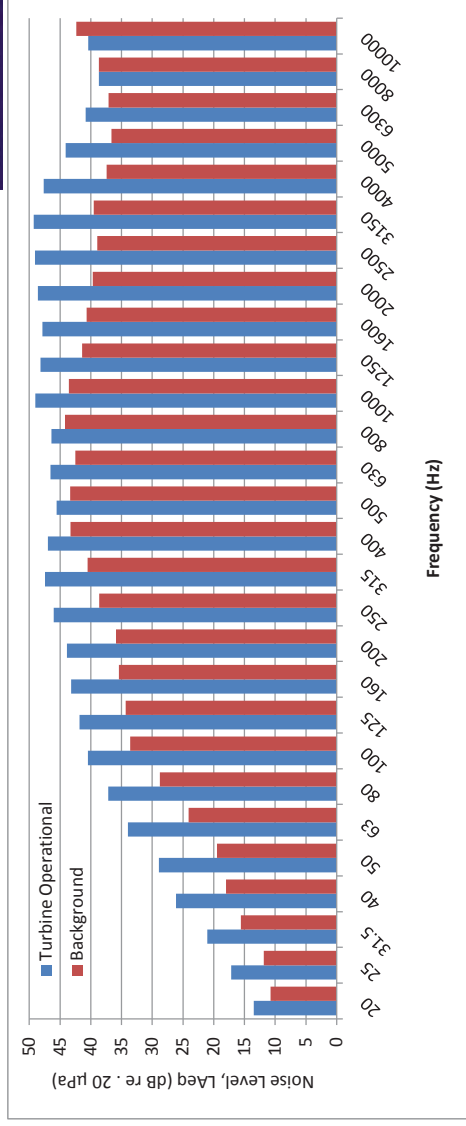


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 11 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	13.5		10.7	
25	17.1		11.9	
31.5	21.0	27.7	15.6	20.6
40	26.1		18.0	
50	28.9		19.5	
63	33.9	39.3	24.1	30.4
80	37.2		28.8	
100	40.5		33.6	39.3
125	41.8		34.3	
160	43.2		35.4	
200	43.9		35.9	
250	46.0	50.8	38.7	43.5
315	47.5		40.5	
400	47.0		43.3	
500	45.6		43.3	
630	46.5		42.5	47.8
800	46.4		44.2	
1000	49.0	52.8	43.5	48.0
1250	48.2		41.4	
1600	47.9		40.7	
2000	48.6	53.3	39.7	44.6
2500	49.1		38.9	
3150	49.3		39.5	
4000	47.7	52.3	37.4	42.8
5000	44.1		36.6	
6300	40.8		37.1	44.7
8000	38.7	44.8	38.7	
10000	40.4		42.4	
Overall	59.6		53.7	

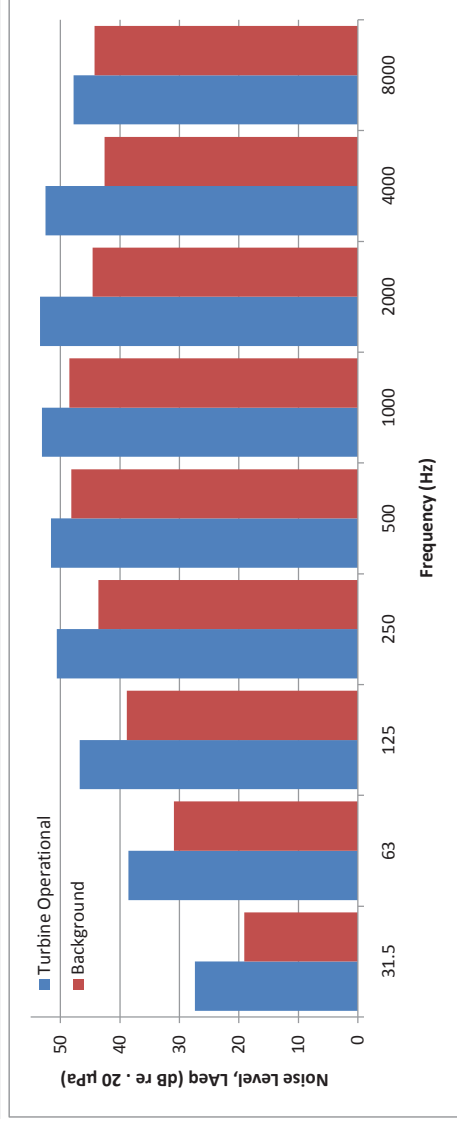
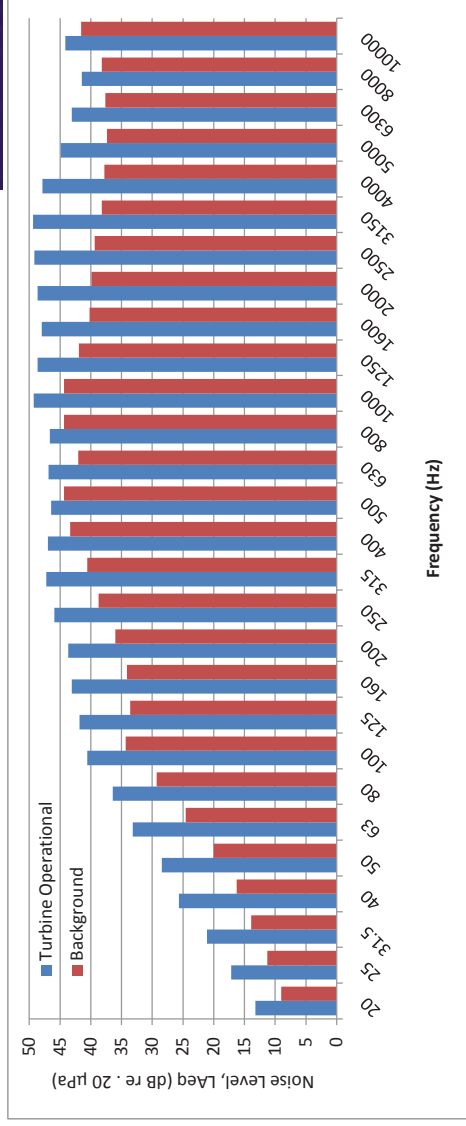


HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 12 m/s



Frequency (Hz)	Turbine Operational		Background	
	1/3 Octave Band (dB(A))	Octave Band (dB(A))	1/3 Octave Band (dB(A))	Octave Band (dB(A))
20	13.2		9.0	
25	17.2		11.3	
31.5	21.1	27.4	13.9	19.1
40	25.7		16.3	
50	28.4		20.0	
63	33.2	38.5	24.5	30.9
80	36.4		29.3	
100	40.6		34.4	
125	41.9	46.7	33.6	38.8
160	43.1		34.1	
200	43.7		36.0	
250	45.9	50.6	38.8	43.6
315	47.3		40.6	
400	47.0		43.4	
500	46.5	51.6	44.4	48.1
630	46.9		42.0	
800	46.7		44.4	
1000	49.3	53.1	44.4	48.5
1250	48.7		42.0	
1600	48.0		40.2	
2000	48.7	53.4	39.9	44.6
2500	49.2		39.4	
3150	49.4		38.2	
4000	47.9	52.5	37.8	42.6
5000	44.9		37.4	
6300	43.1		37.6	
8000	41.5	47.8	38.2	44.3
10000	44.1		41.5	
Overall	59.9		53.8	



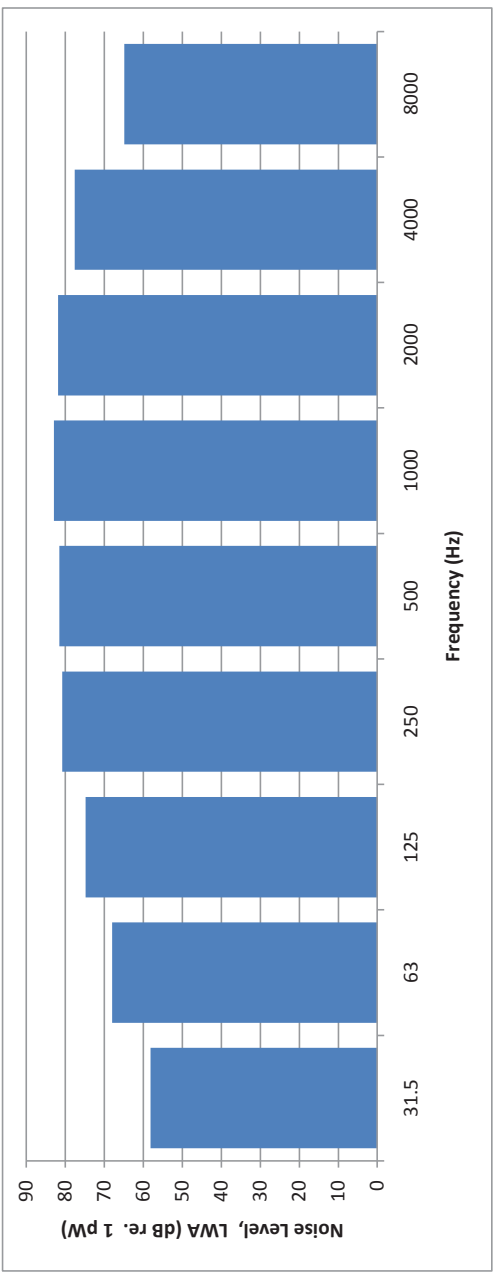
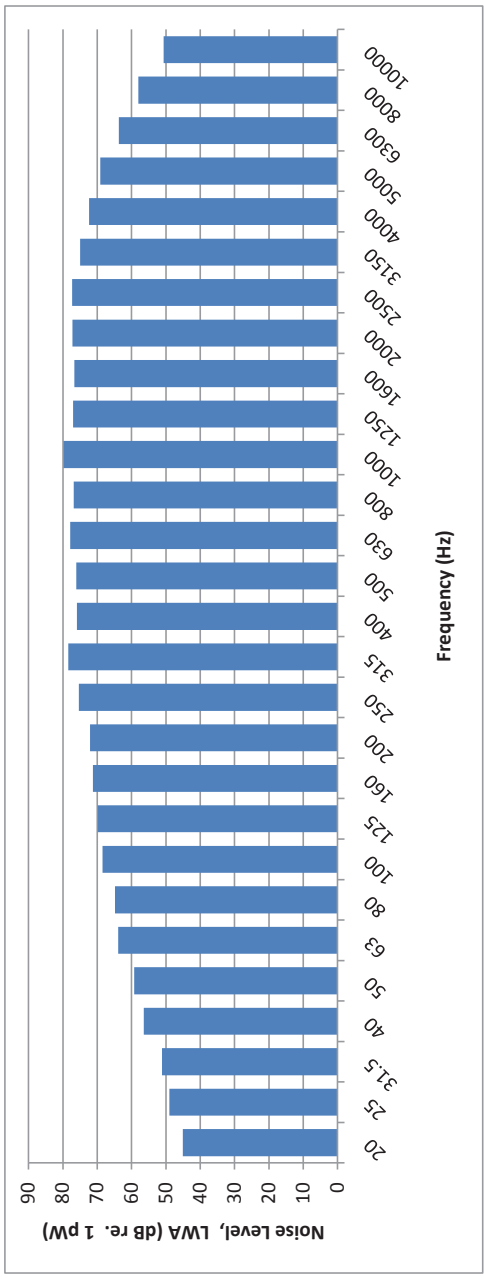
Appendix G
Background Corrected One Third Octave Sound
Power Levels

HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 6 m/s



Frequency (Hz)	1/3 Octave Band (dB LWA)	Octave Band (dB LWA)
20	45.1	
25	49.0	
31.5	51.1	58.1
40	56.4	
50	59.2	
63	63.9	68.0
80	64.9	
100	68.4	
125	69.9	74.8
160	71.3	
200	72.1	
250	75.3	80.8
315	78.4	
400	75.9	
500	76.1	81.5
630	77.8	
800	76.8	
1000	79.8	82.9
1250	77.1	
1600	76.7	
2000	77.2	81.9
2500	77.3	
3150	75.0	
4000	72.4	77.6
5000	69.1	
6300	63.7	
8000	58.0	64.9
10000	50.6	
Overall	88.5	



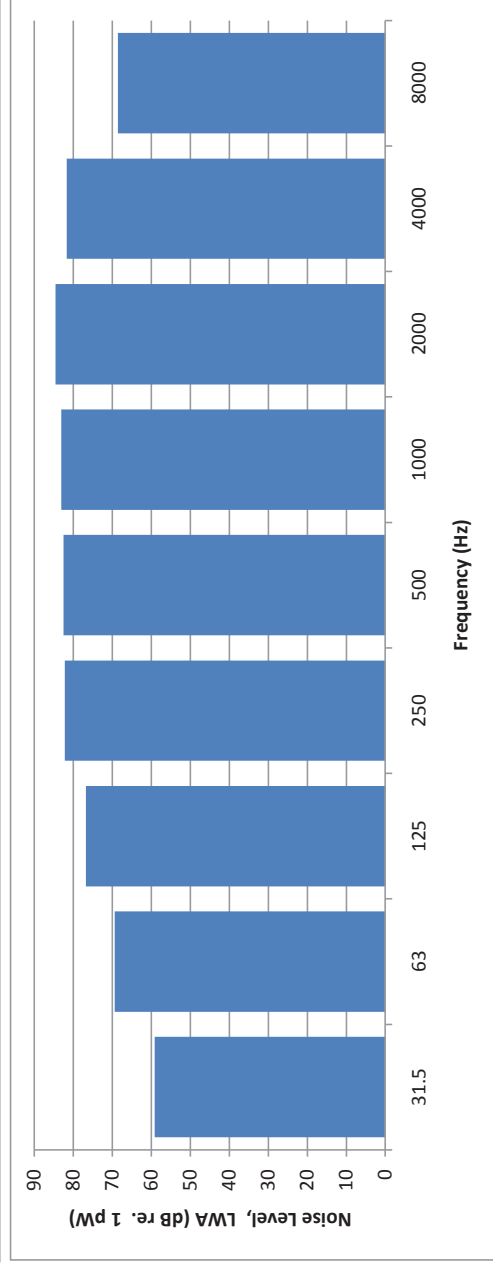
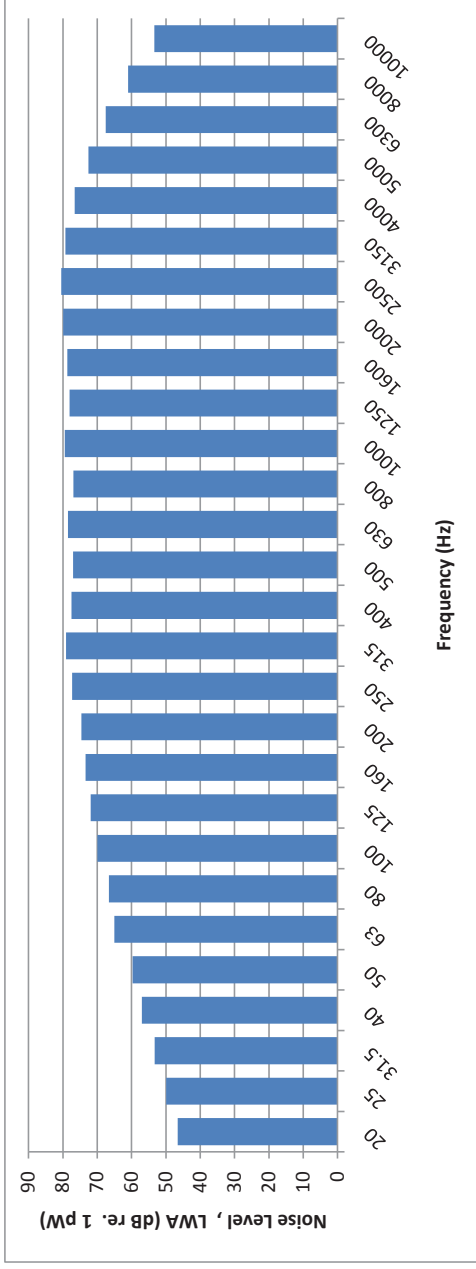
Endurance E-3120 Wind Turbine Wind Speed - 7 m/s*



Frequency (Hz)	1/3 Octave Band (dB LWA)	Octave Band (dB LWA)
20	46.5	
25	49.9	
31.5	53.2	59.1
40	57.0	
50	59.7	
63	65.0	69.4
80	66.6	
100	69.9	
125	71.9	76.7
160	73.4	
200	74.6	
250	77.3	82.1
315	79.1	
400	77.5	
500	77.0	82.5
630	78.6	
800	76.9	
1000	79.4	83.0
1250	78.1	
1600	78.7	
2000	80.0	84.5
2500	80.5	
3150	79.3	
4000	76.6	81.7
5000	72.5	
6300	67.6	
8000	61.0	68.6
10000	53.4	

Overall	90.2
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*Background taken from 6m/s



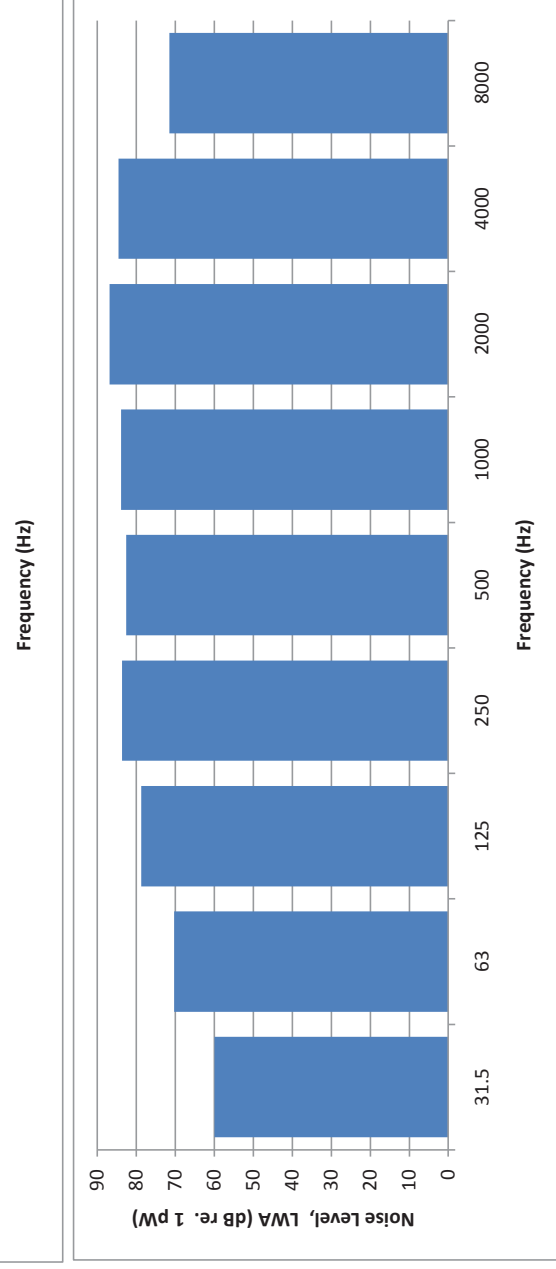
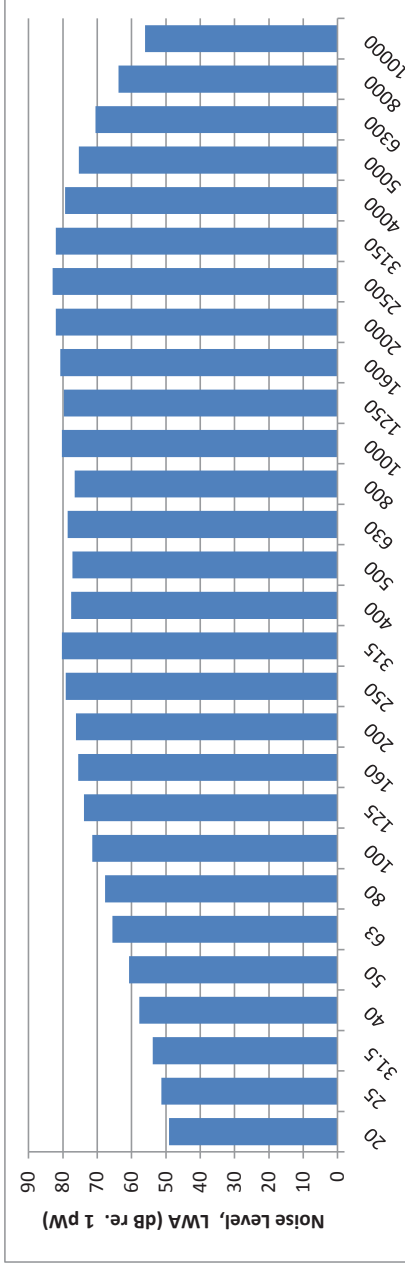
HM:2300/R1

Endurance E-3120 Wind Turbine Wind Speed - 8 m/s



Frequency (Hz)	1/3 Octave Band (dB LWA)	Octave Band (dB LWA)
20	49.1	
25	51.3	
31.5	53.9	59.9
40	57.8	
50	60.7	
63	65.6	70.3
80	67.7	
100	71.4	
125	73.9	78.7
160	75.6	
200	76.2	
250	79.2	83.7
315	80.3	
400	77.6	
500	77.2	82.6
630	78.6	
800	75.9*	83.9
1000	80.3	
1250	79.7	
1600	80.8	86.8
2000	82.1	
2500	83.0	
3150	82.1	84.5
4000	79.4	
5000	75.3	
6300	70.5	71.5
8000	63.9	
10000	56.1	

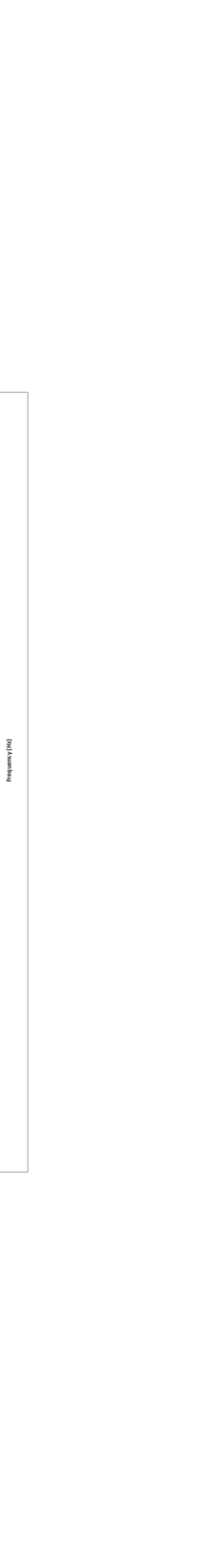
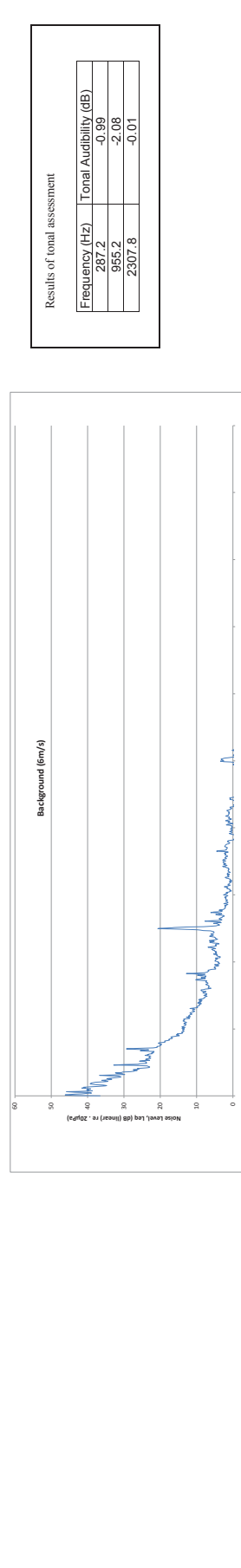
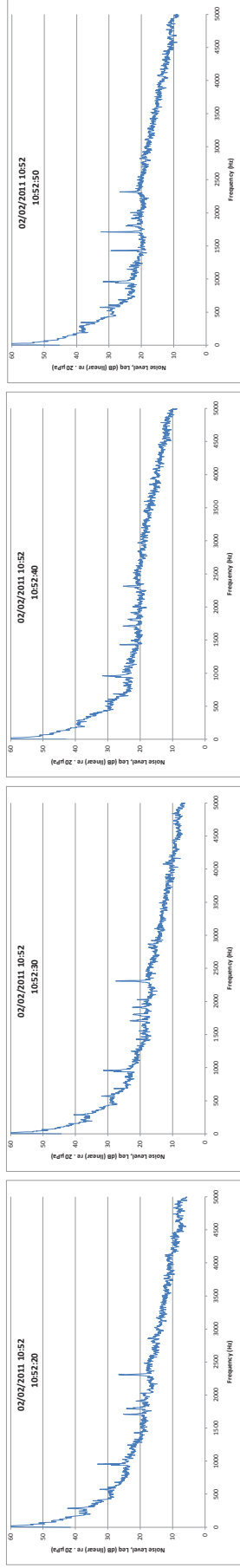
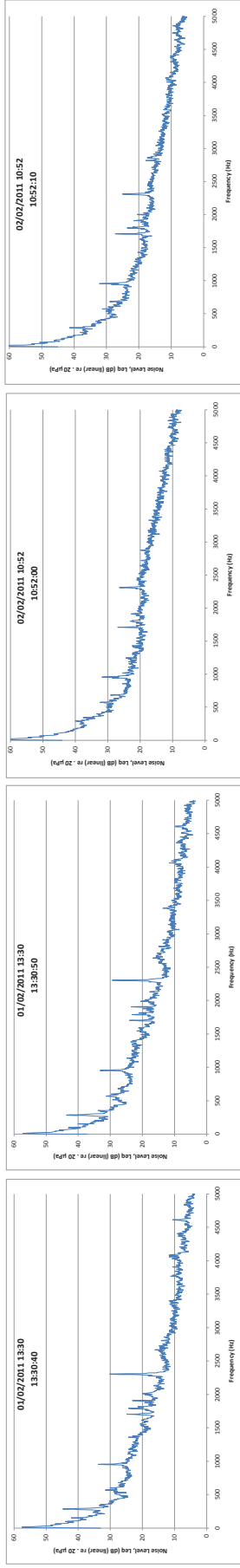
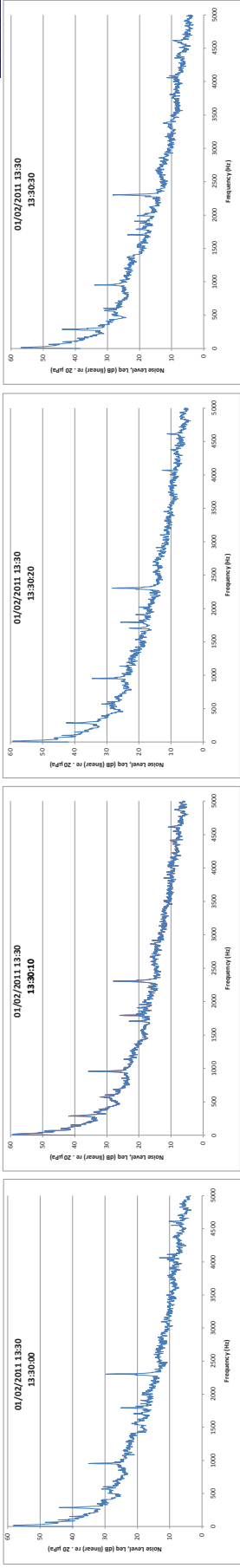
Overall	91.8
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Appendix H

Narrowband Analysis

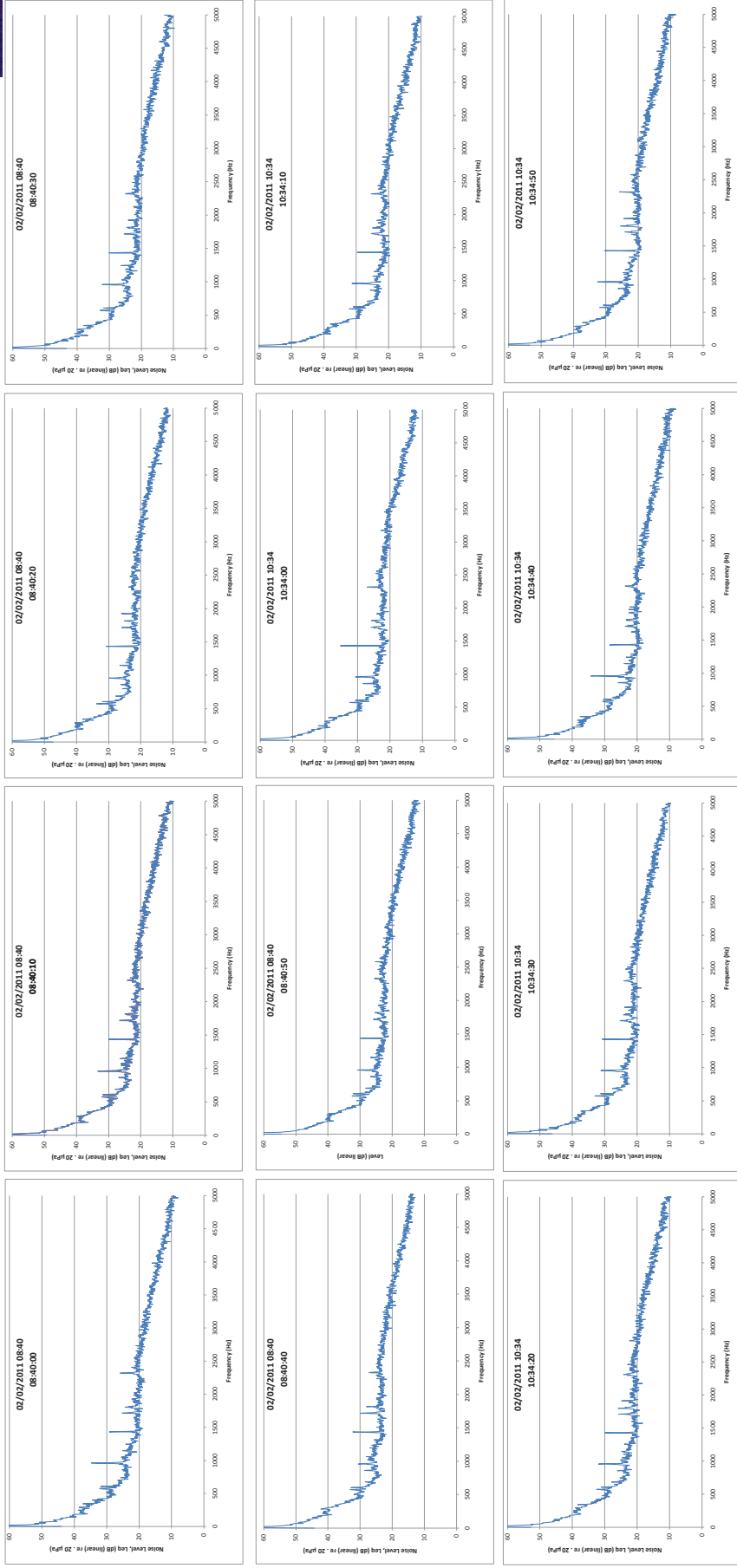
Endurance E-3120 - Narrowband Spectra
6m/s Wind Speed



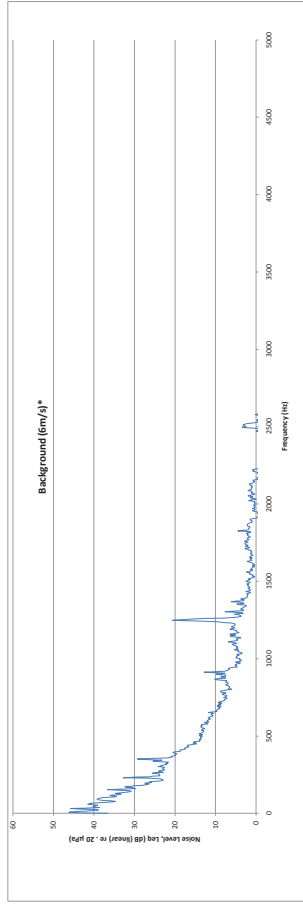
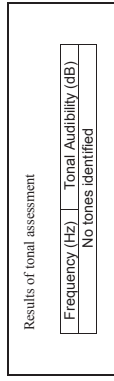
Results of tonal assessment

Frequency (Hz)	Tonal Audibility (dB)
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955.2	-2.08
2307.6	-0.01

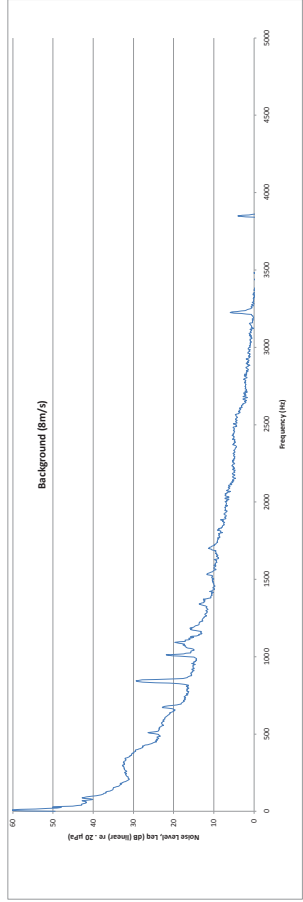
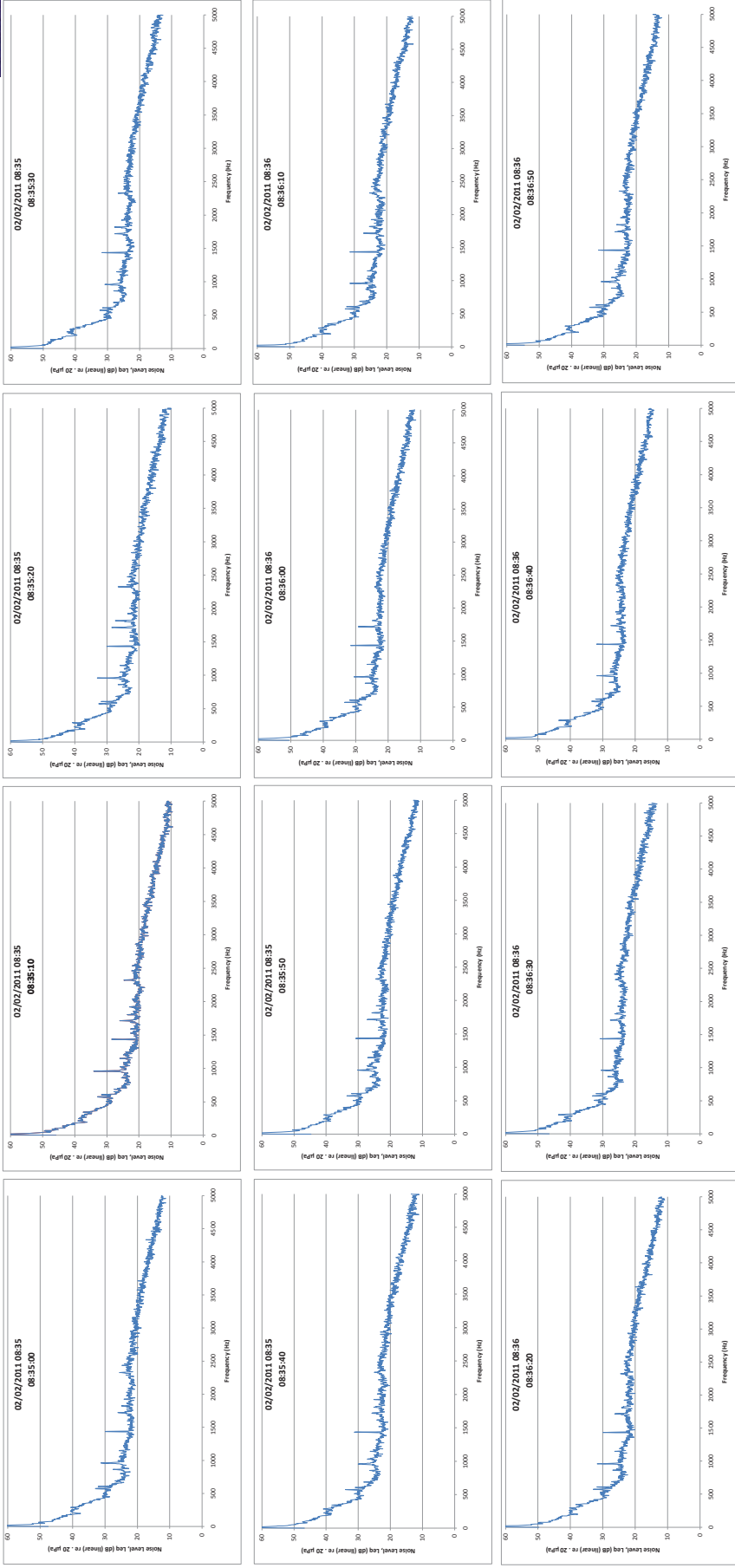
Endurance E-3120 - Narrowband Spectra
7m/s Wind Speed



*No background noise data for 7m/s



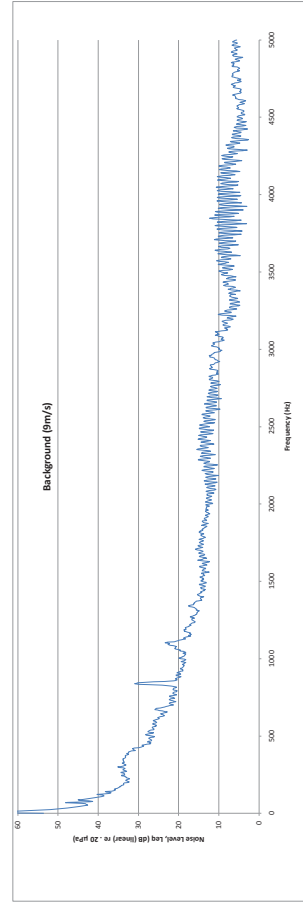
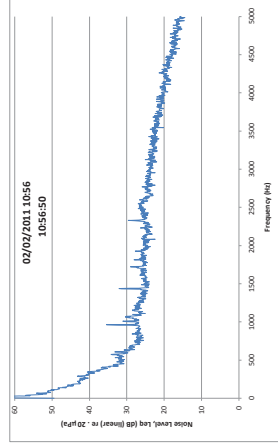
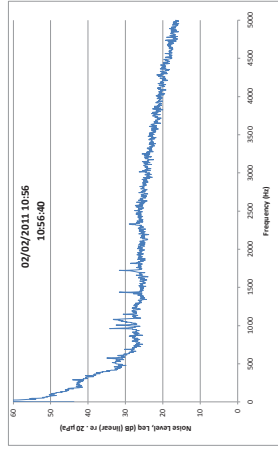
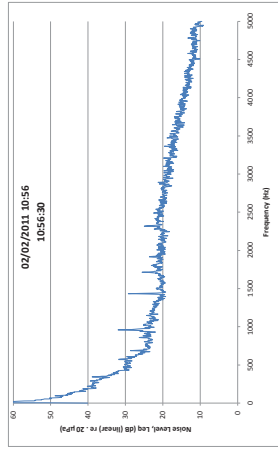
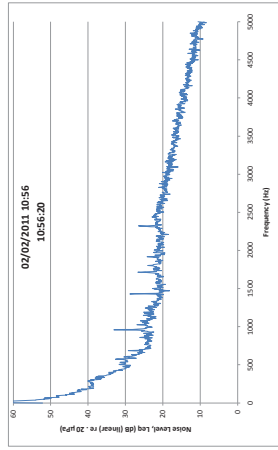
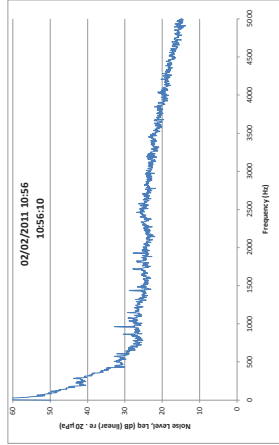
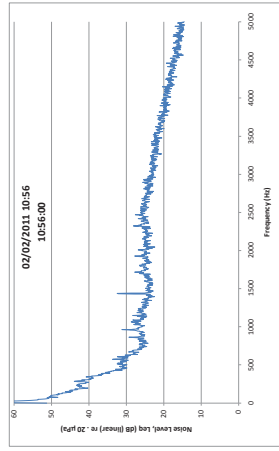
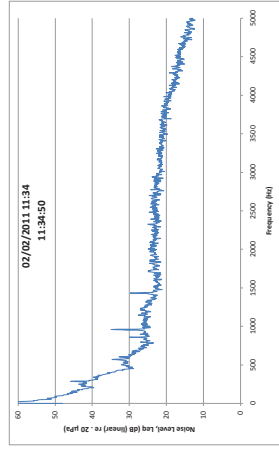
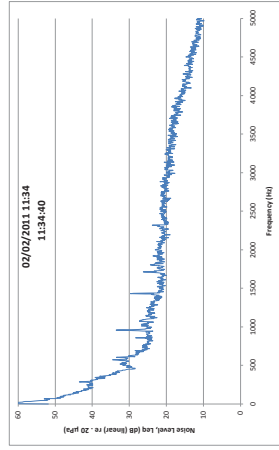
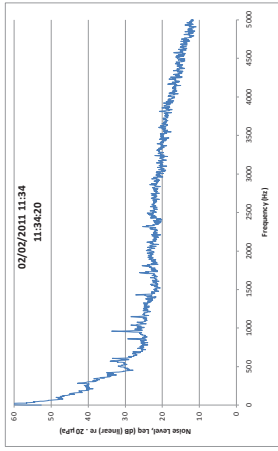
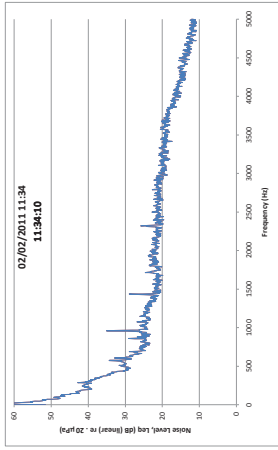
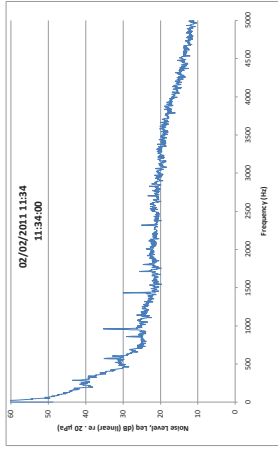
Endurance E-3120 - Narrowband Spectra
8m/s Wind Speed



Results of tonal assessment

Frequency (Hz)	Tonal Audibility (dB)
No tones identified	

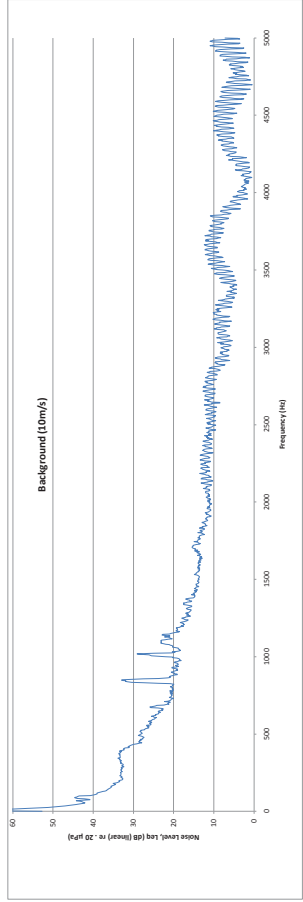
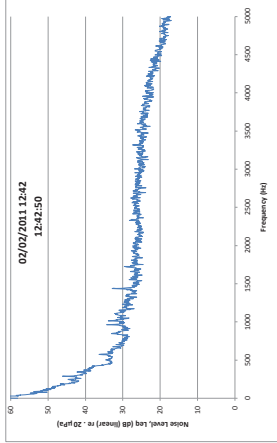
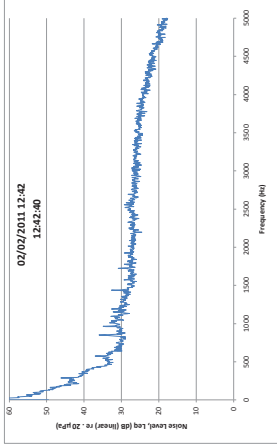
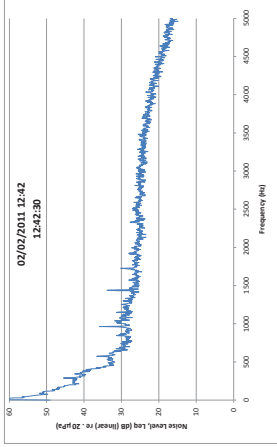
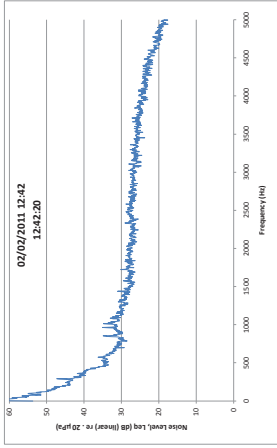
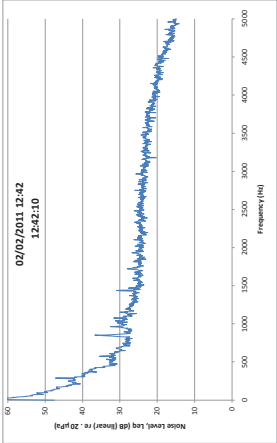
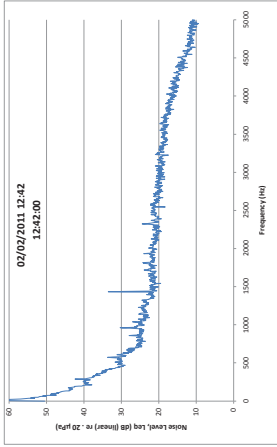
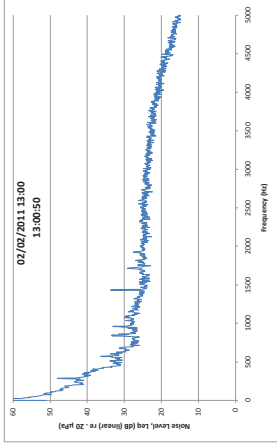
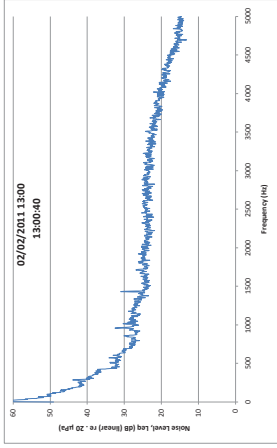
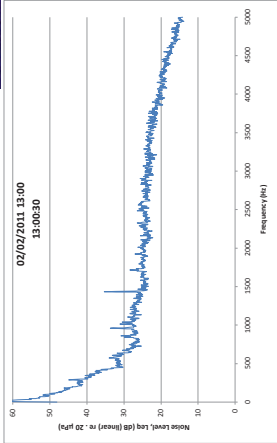
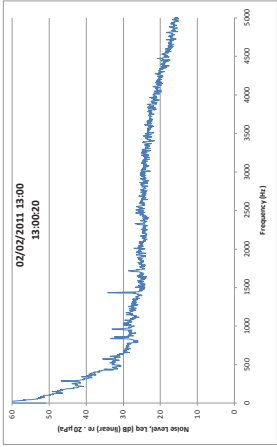
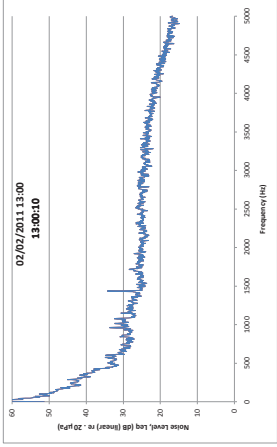
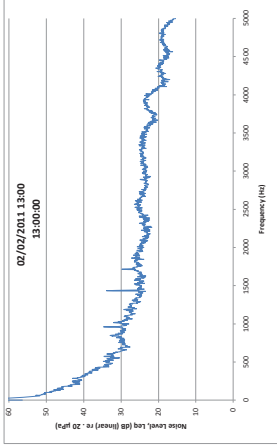
Endurance E-3120 - Narrowband Spectra
9m/s Wind Speed



Results of tonal assessment

Frequency (Hz)	Tonal Audibility (dB)
No tones identified	

Endurance E-3120 - Narrowband Spectra
10m's Wind Speed



Results of tonal assessment

Frequency (Hz)	Tonal Audibility (dB)
No tones identified	



APPENDIX 4 : Radar / Aviation SUPPORTING INFORMATION LIST

ARIVORE FARM planning application

Doc	Title	Drg. No	S / S	Rev
26	Arivore Radar Report			



Aeronautical Sites at Risk from Wind Energy Developments

Quick Check Analysis

Date: 06 February 2013

Location name:	Arivore Farm		
OSGB Easting:	182368	OSGB Northing:	661097
LandRanger® Grid	NR8236861097		
Remarks:	Indicative Turbine Location		
Terrain Model Used:	SRTM3		

Are there any Officially Safeguarded airfields within 30km?		No	
Airfield Name:	N/A	Airfield Distance:	N/A
Remarks:	N/A		

Are there any other airfields that may need to be considered?		No	
Airfield Name:	N/A	Airfield Distance:	N/A
Remarks:	N/A		

Are there any radar installations that may need to be considered?		Yes	
Radar site name:	Tiree PSR	Radar site distance:	116.48km
Maximum blade tip height likely to be tolerable:		Not an issue	
Remarks:	NERL. There is significant terrain screening between the locations.		
Radar site name:	Lowther Hill PSR	Radar site distance:	117.93km
Maximum blade tip height likely to be tolerable:		136m AGL	
Remarks:	NERL. There is good Fresnel Zone attenuation along the path. It should be noted that line of sight occlusion occurs at blade tip heights less than 130m AGL with terrain screening at Cnoc an t-Suidhe (188265, 658215)		

Are there any aeronautical navigational aids that need to be considered?		No	
Navaid name:	N/A	Navaid distance:	N/A
Remarks:	N/A		

Are there any aeronautical communications sites that need to be considered?		No	
Site Name:	N/A	Site distance:	N/A
Remarks:	N/A		

General Remarks:	The only limiting factor will be with Lowther Hill radar and that is unlikely to result in any objection.
------------------	--

Abbreviations used

AGL	Above Ground Level
km	kilometres
m	metres
N/A	Not Applicable
NERL	NATS En-Route Ltd
OSGB	Ordnance Survey of Great Britain
PSR	Primary Surveillance Radar
SRTM3	Shuttle Radar Topography Mission – 3 arc-second resolution

Please Note:

These Quick Check assessments should not be considered as suitable for submission to planning authorities as evidence of a site having been fully, technically, evaluated against the risk of detection by radar, or of having limited effect on other aviation assets such as navigational aids or communications sites.

The purpose of these assessments is to assist with the selection of sites and equipment such that there is a reduced risk of causing clutter on radar or harmful interference to other aviation assets. Where a turbine tip height is selected that is close to that suggested in this assessment, it is strongly recommended that a full technical assessment is carried out to provide tabulated results using an ITU recommended propagation model.



Access and Transportation Route Assessment

Site Access

This statement is in conjunction with the application 13/02164/PP (amended for a single turbine) at location 661166E, 182585N at Arivore Farm, Argyll and Bute.

It has been highlighted that the private access road leading from the A83 have '*some particularly tight corners*', therefore please refer to the attached plans 'ROAD ACCESS HEAD DETAILS 4 & 5' which show detailed analysis of the swept area. As seen within the attached plan 'ROAD ACCESS HEAD DETAIL 5', the tightest turning along the local private road is adjacent to Home Farm and as demonstrated within the plan there is a run-off area by Home Farm that is sufficiently large enough to assist construction traffic in manoeuvring round the corner.

In regards to the existing condition of the access road, after completion of the delivery of the turbine and on completion of the construction works, the road will be repaired to the standard pre construction. This should be conditioned.

There will be minimal disruption to local access as it is anticipated that no road closures will be required for the delivery of the turbine. Prior to the delivery agreed times should be negotiated between the residents and the delivery company.

A degree of cut back *may* be required to the existing hedgerow and tree branches to ensure a safe delivery, but there will be no damage to the main tree or hedgerow stems or to the root areas.

Size and Type of Vehicles

The typical loads for the proposed Endurance E-3120 are as follows:

The nacelle, 3 x 10m blades, rotor hub and misc. parts all delivered in 1 x 40ft ISO shipping container carried by low loader. Gross weight 12t which includes the container. Tower sections in three nested sections contained in additional container, largest section 11.7m, gross weight 13.8t, again, transported by low loader.

Associated loads will be required for turbine base construction, cabling and work force as detailed in the table below.

Indicative Schedule of Construction Loads

Material	Number of Loads	Vehicle Type	Comments
Turbine Tower	1	Standard 40ft HGV	Only one delivery required to turbine site.
Turbine nacelle, blades, rotor and misc. items (incl. power cables)	1	Standard 40ft HGV	Only one delivery required to turbine site.
Ready mix concrete	10	7m ³ concrete mixers	Turbine base requires approx. 70m ³ of concrete. Material will



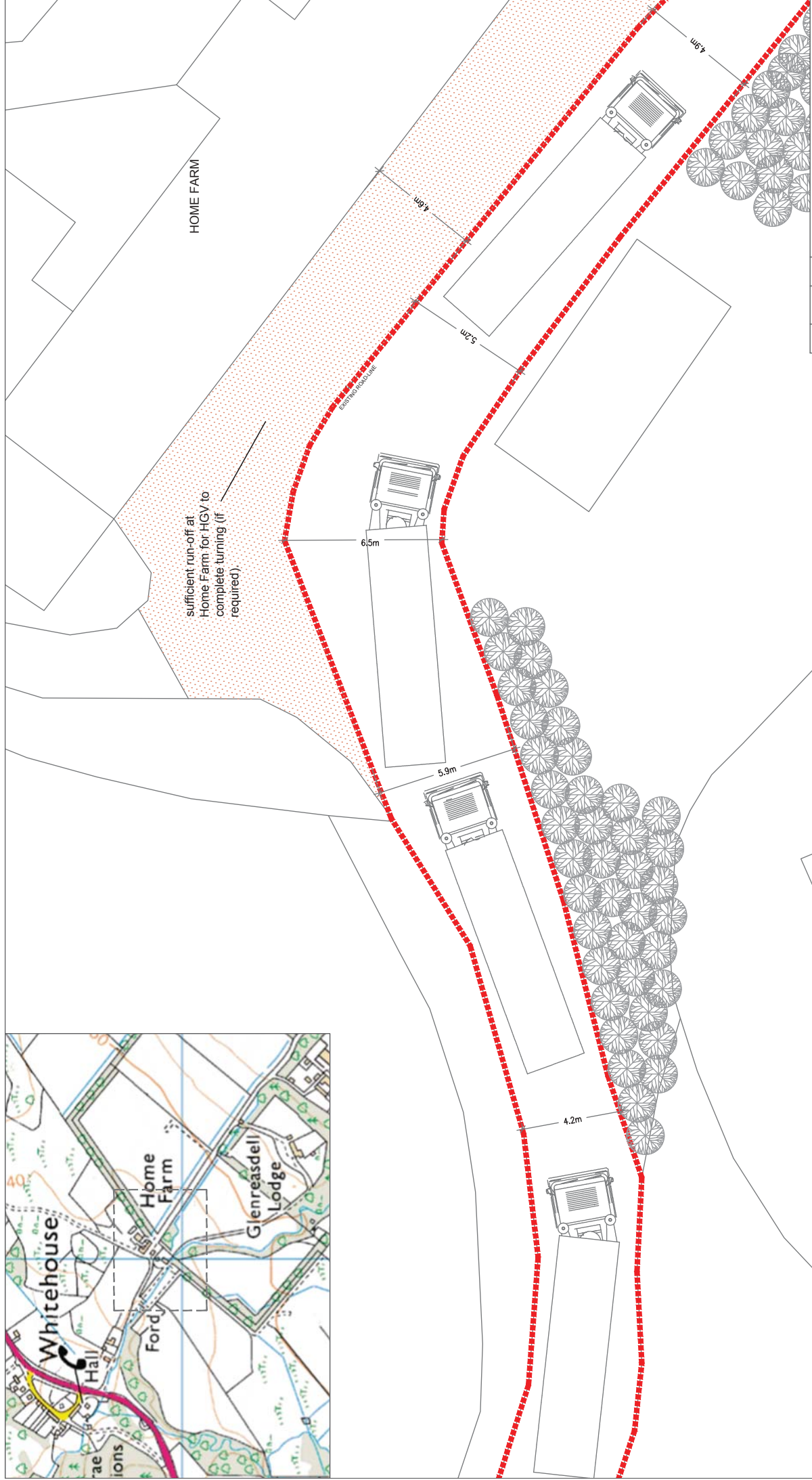
			be sourced locally if possible.
Misc. materials	1		Ancillary items
Farm based excavator	1	Excavator	Sourced from farm. Trips to and from farm.
Crane	1	35t crane	Temp. crane pad 20mx12m
Reinforced steel and foundation parts	1	Standard 40ft HGV	Approx. 9 tonne of rebar required and misc. items
Electricity cabling	1	Standard 40ft HGV	
Workforce	5 personnel	2 x vans	Installation takes approx. 5 days for crane operator, a foreman, operating engineer and two riggers.

ROAD ACCESS HEAD DETAILS (pre-turbine construction) 1:150



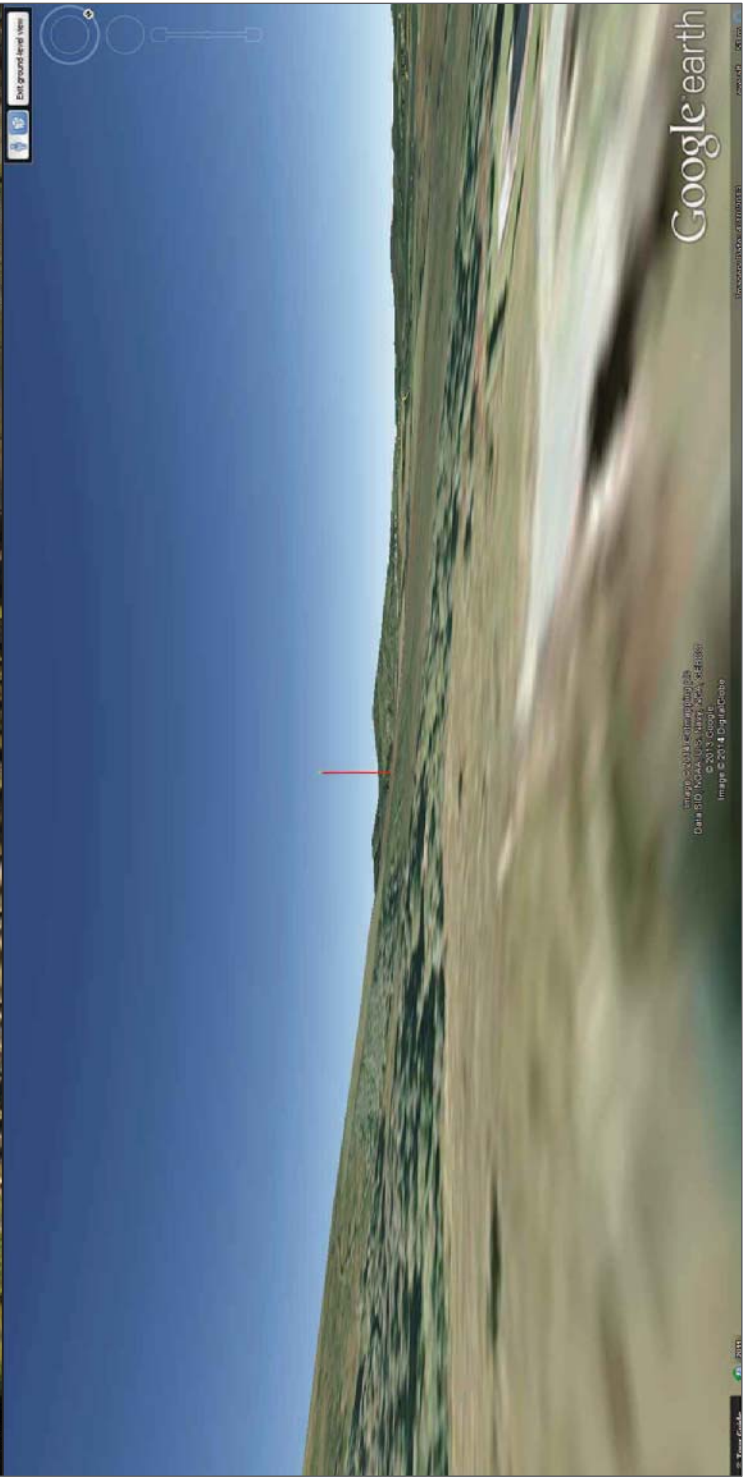
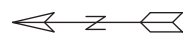
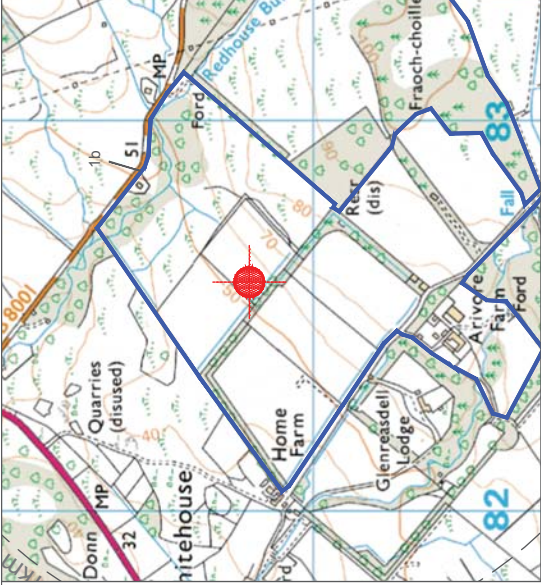
Pool

REV	DATE	BY	REASON
			
PROJECT: 9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROPOSED: Proposed Wind Turbine Installation CLIENT: Aivore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182864.5E, 661104N SITE / CO-ORD:			
DRAWN BY: SS SCALE: 1:150 DATE: 27/01/2014 TITLE: ROAD ACCESS HEAD DETAIL 4 DWG NO: ROADS-04			

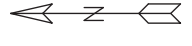
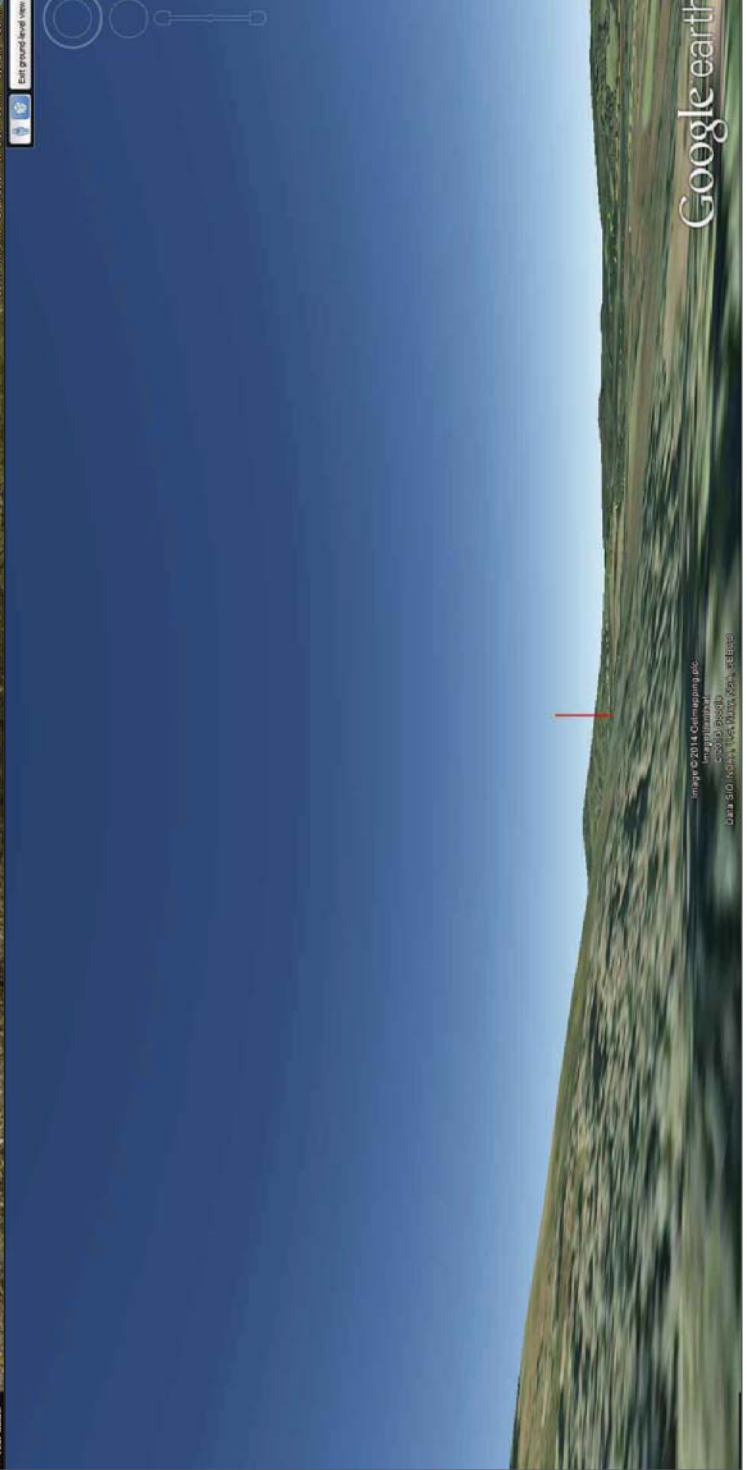
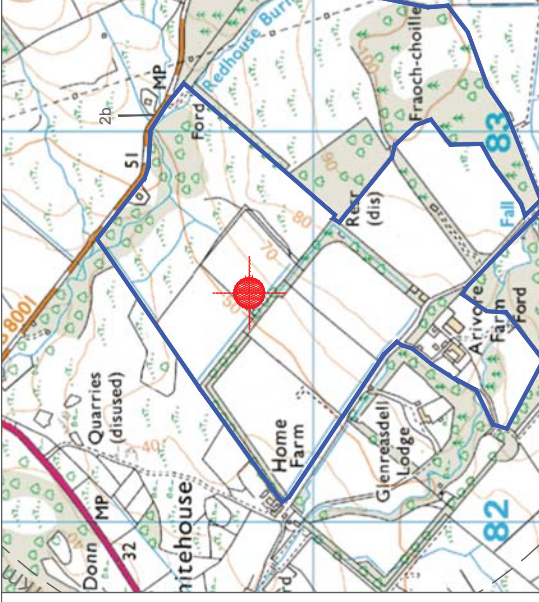


REV	DATE	BY	REASON
			
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT: Proposed Wind Turbine Installation CLIENT: Airvore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182664.5E, 661104N			
DRAWN BY: SS SCALE: 1:150 DATE: 27/01/2014			
TITLE: ROAD ACCESS HEAD DETAIL 3 DWG NO: ROADS-05			

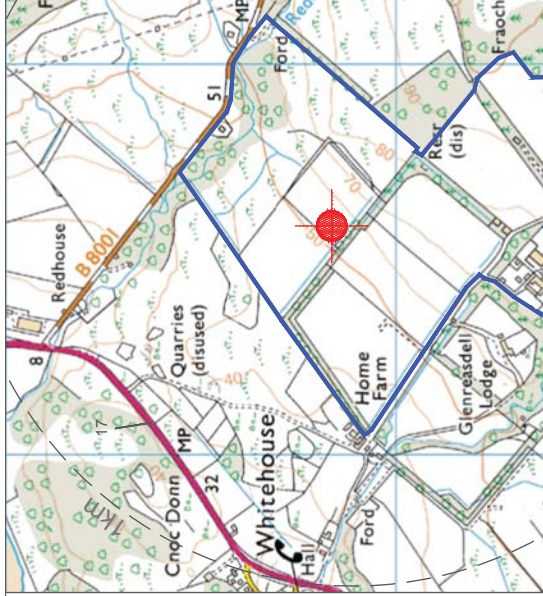
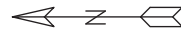
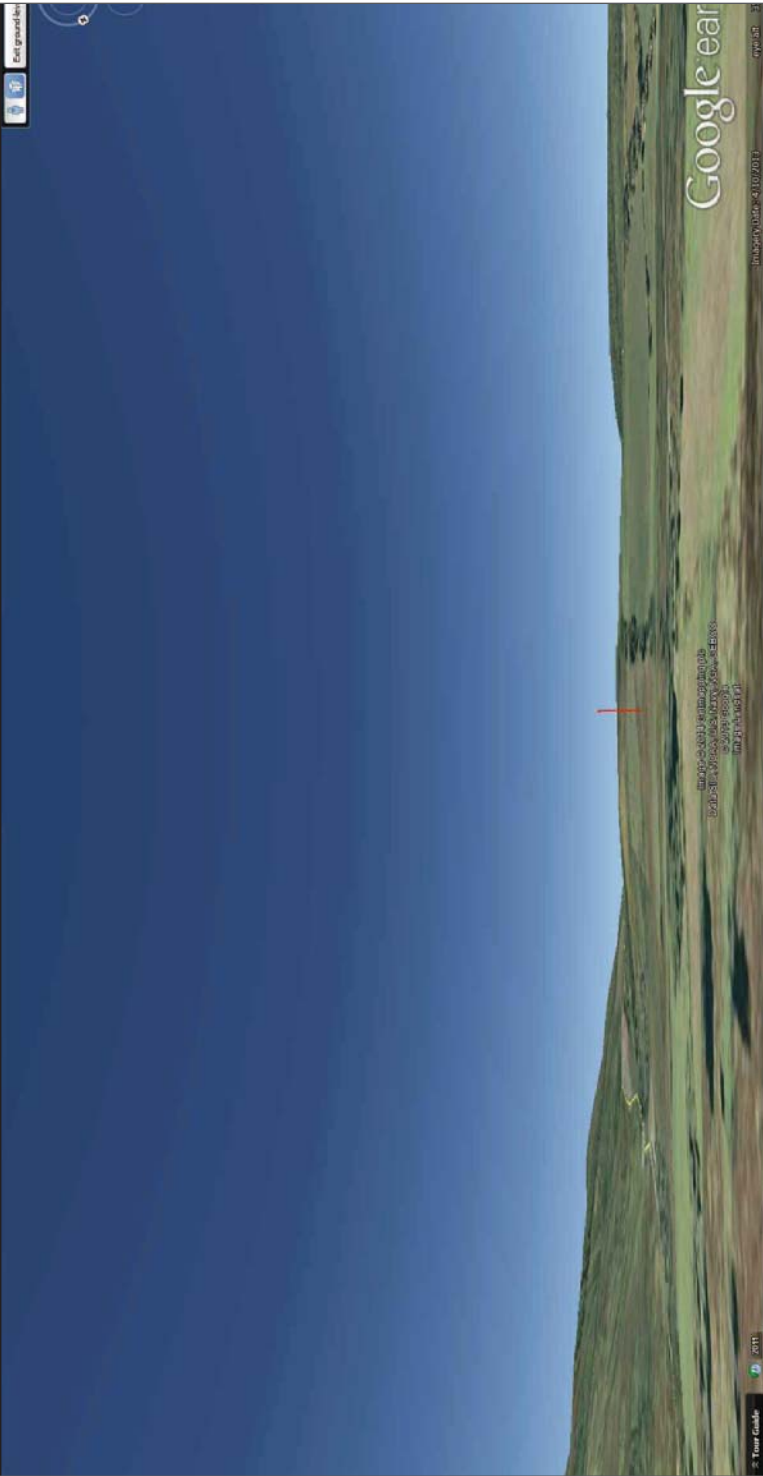
ROAD ACCESS HEAD DETAILS (pre-turbine construction) 1:150



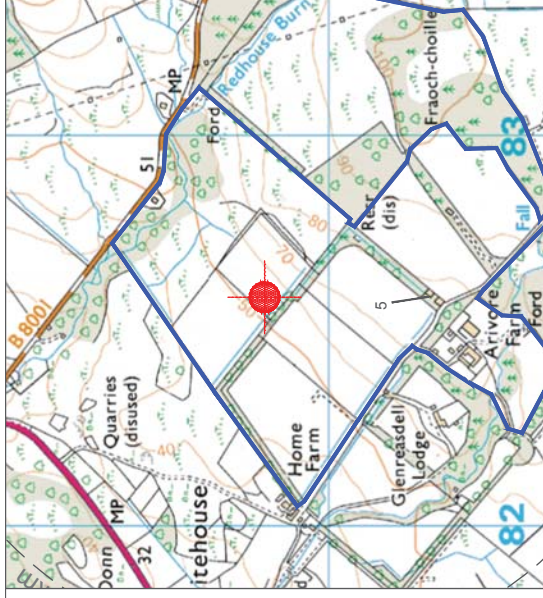
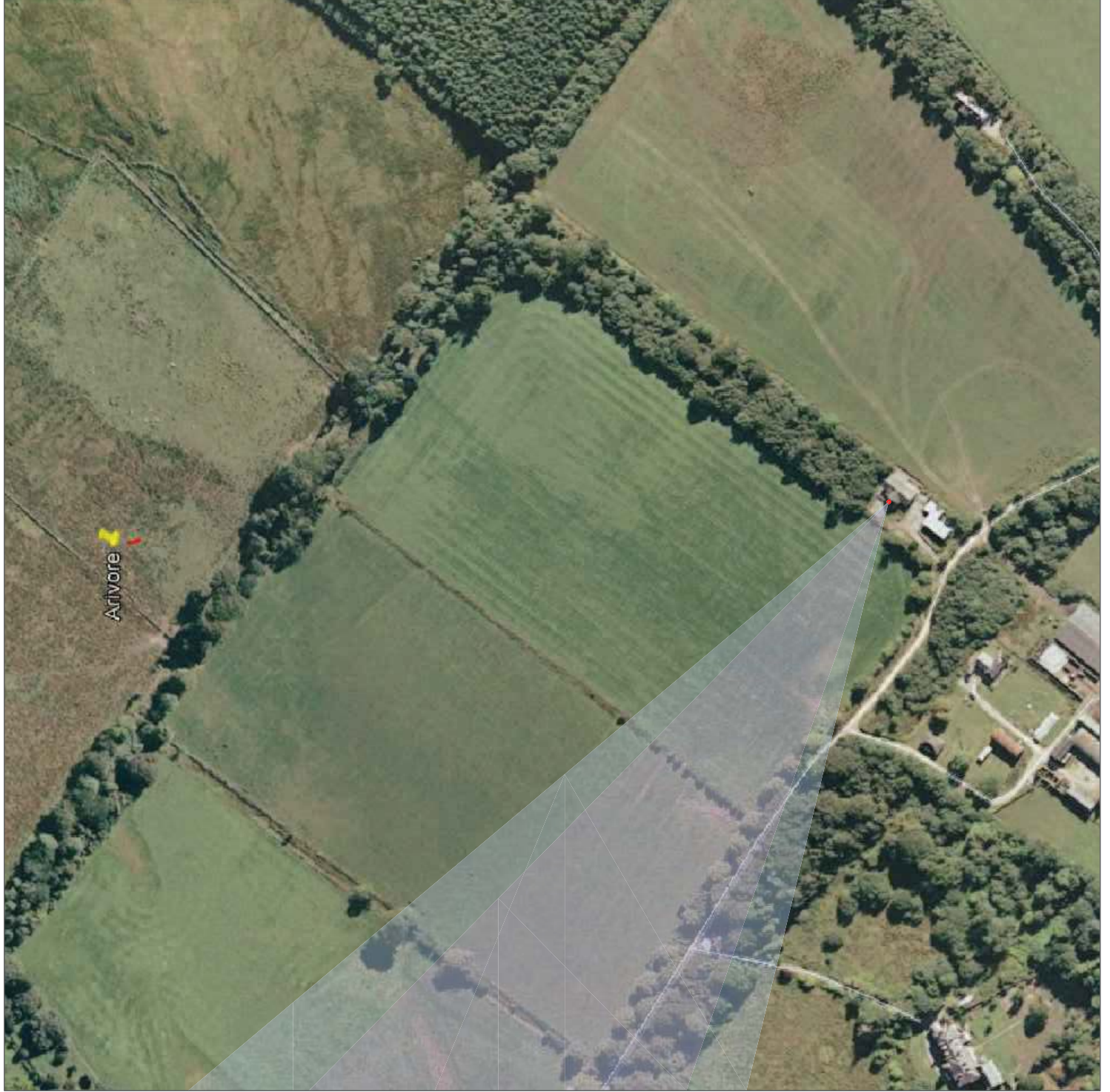
REV	DATE	BY	REASON
			
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tabbert. ADDRESS: CENTRE OF SITE - 182588E, 661166N SITE / CO-ORD:			
DRAWN BY: SS SCALE: N.T.S. DATE: 13/02/2014 TITLE: GOOGLE STREET VIEW - 1b DWG NO: GSV.01B			



REV	DATE	BY	REASON
			 <p>9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk</p>
			<p>PROJECT: Proposed Wind Turbine Installation CLIENT: Arivoire, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182588E, 661166N SITE / CO-ORD:</p>
			<p>DRAWN BY: SS SCALE: N.T.S. DATE: 13/02/2014 TITLE: GOOGLE STREET VIEW - 2b DWG NO: GSV.02B</p>



REV	DATE	BY	REASON
			 <p>9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk</p>
			<p>PROJECT: Proposed Wind Turbine Installation CLIENT: Arivore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182588E, 661166N SITE / CO-ORD:</p>
			<p>DRAWN BY: SS SCALE: N.T.S. DATE: 13/02/2014 TITLE: Google Street View - 17 DWG NO: GSV.17</p>



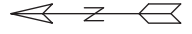
Horizontal field of view 39.6 degrees

(in accordance to the Highland Council Measurement Standards for Wind Energy Developments)



Horizontal field of view 28.8 degrees

(in accordance to the Highland Council Measurement Standards for Wind Energy Developments)



REV / DATE BY REASON

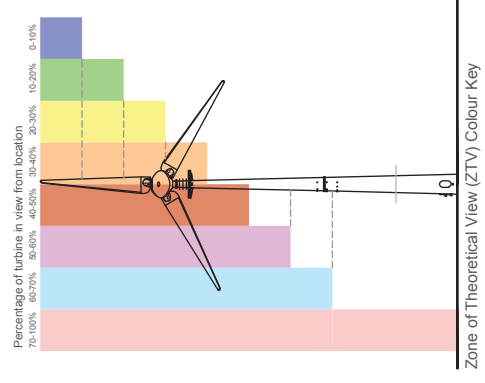
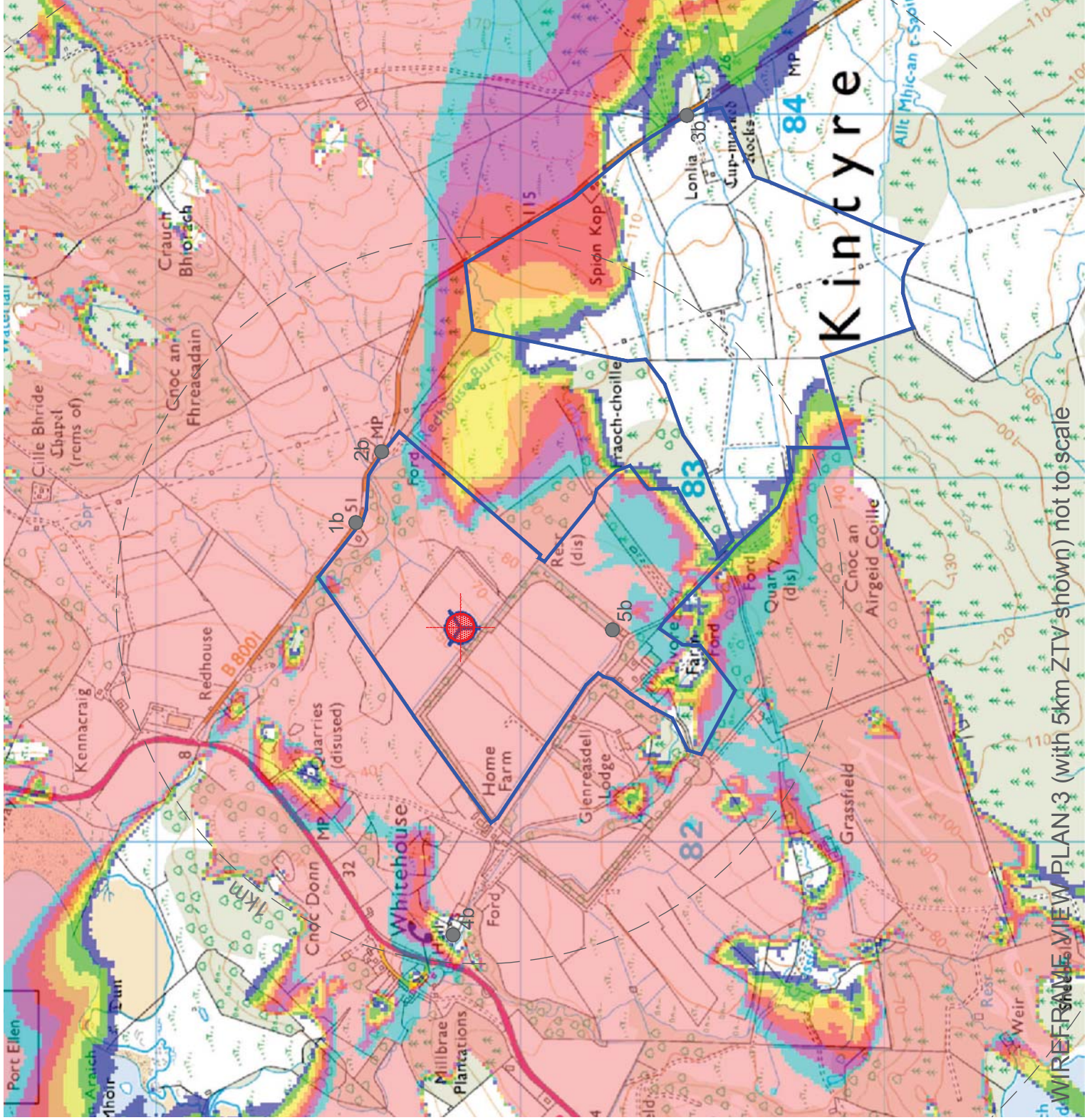



9 KINGSKNOWE PARK
EDINBURGH
EH14 2JQ
T: 0131 443 0040
W: www.fineenergy.co.uk

PROJECT:
CLIENT:
ADDRESS:
SITE / CO-ORD:

Proposed Wind Turbine Installation
Arivore, Whitehouse, Tabbert.
CENTRE OF SITE - 182588E, 661166N

DRAWN BY: SS
SCALE: N.T.S.
DATE: 13/02/2014
TITLE: HORIZONTAL FIELD OF VIEW - 5 | DWG NO: HFV.05



REV	DATE	BY	REASON
			
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT:	Proposed Wind Turbine Installation		
CLIENT:	Aivore, Whitehouse, Tarbert.		
ADDRESS:	CENTRE OF SITE - 182588E, 661166N		
SITE / CO-ORD:			
DRAWN BY:	SS	SCALE:	N.T.S.
TITLE:	WIREFRAMES & 5km ZTV		DATE: 28/01/2014
			DWG NO: WF01-ZTV3

WIREFRAME VIEW PLAN 3 (with 5km ZTV shown) not to scale

VIEW 1b - wireframe

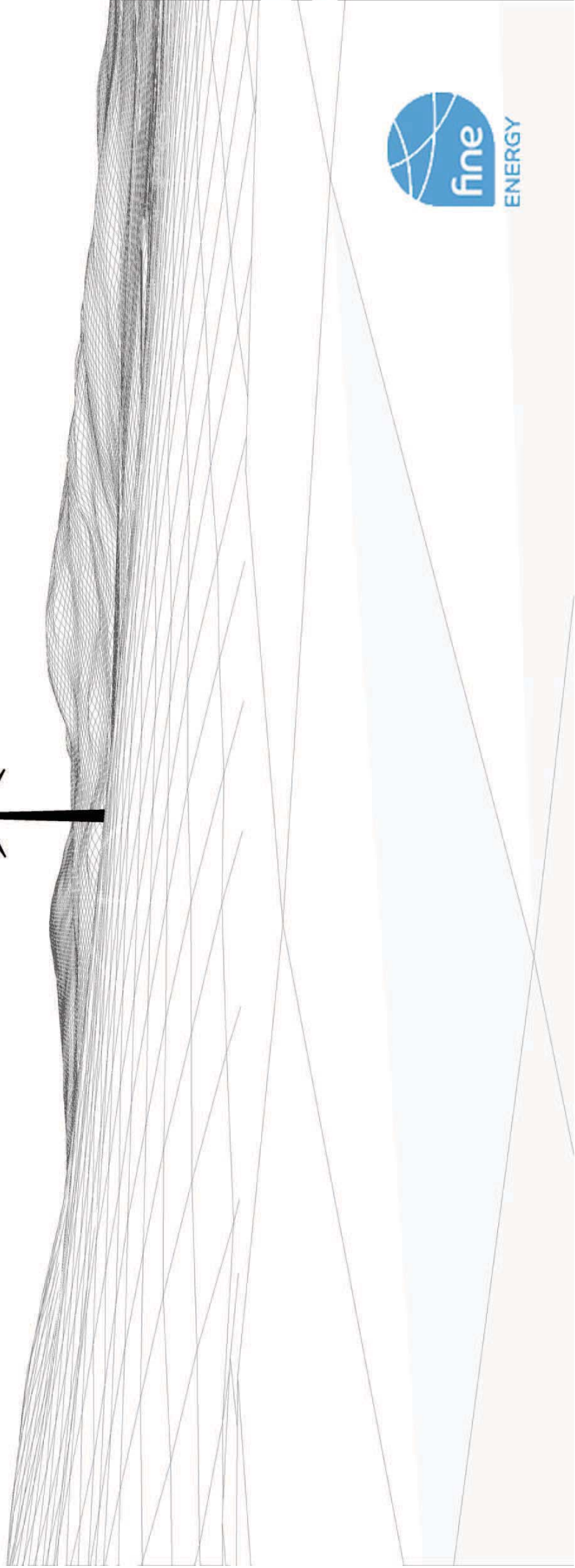
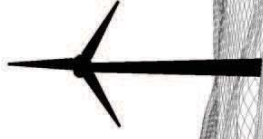
Looking southwest on the B8001, 755m southeast of the junction at Redhouse

CO-ORDINATES OF VIEW POINT - 182881E, 661438N

DISTANCE TO APPLICATION TURBINES - 408m

ORIENTATION OF VIEW - 228degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 2b - wireframe

Looking southwest on the B8001, from the entrance to Craig View

CO-ORDINATES OF VIEW POINT - 183048E, 661407N

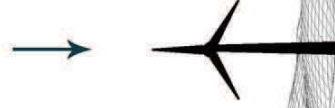
DISTANCE TO APPLICATION TURBINES - 531m

ORIENTATION OF VIEW - 245degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @ A4.



1 no. 23.8m high turbine (to tip) @
Kilchamaig Farm, Tarbert
ref: 12/00241/PP
status: GRANTED



VIEW 3b - wireframe

Looking southwest on the B8001, from the entrance to Lonlia

CO-ORDINATES OF VIEW POINT - 184004E, 660542N

DISTANCE TO APPLICATION TURBINES - 1.54km

ORIENTATION OF VIEW - 295degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.

Proposed Wind Turbine
Not Visible from Lonlia



VIEW 4b - wireframe

Looking east from the Community Hall, 69m east of the A83

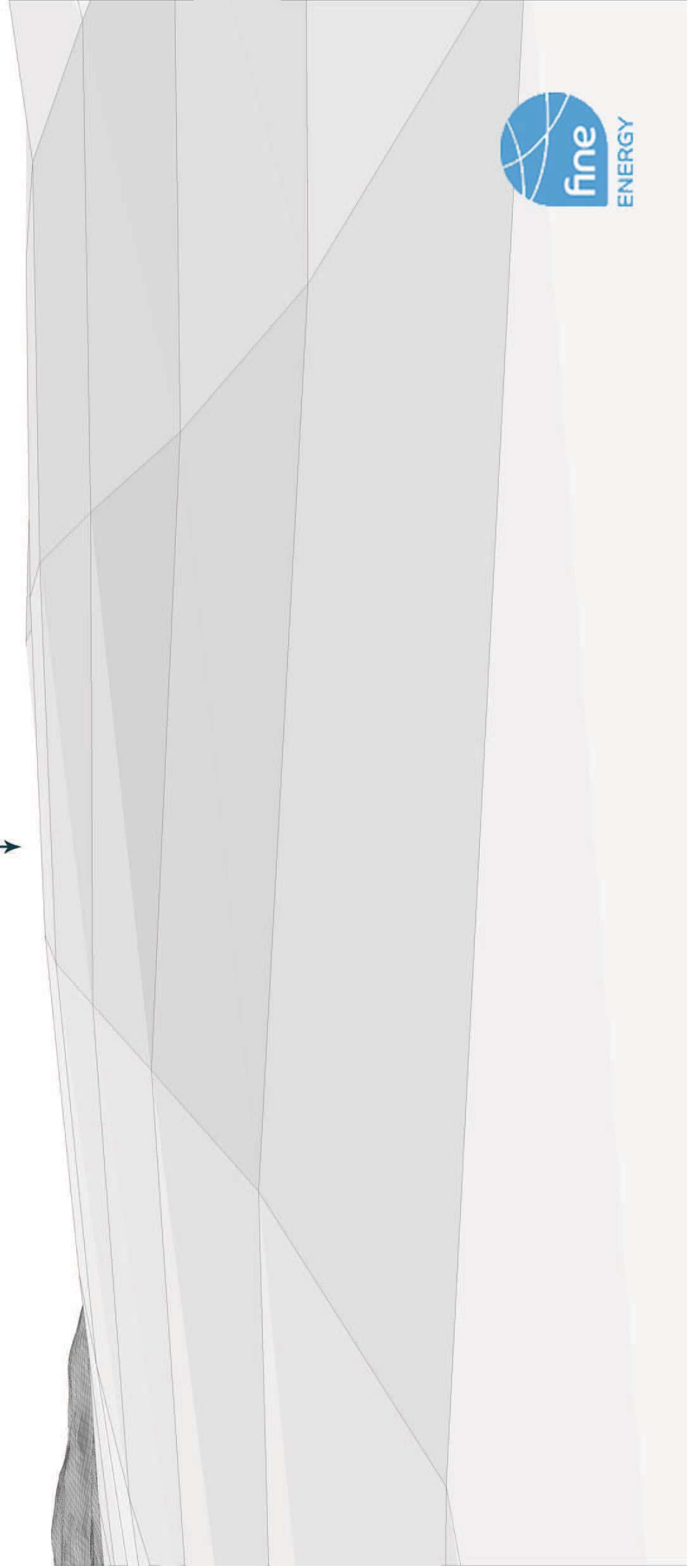
CO-ORDINATES OF VIEW POINT - 181748E, 661174N

DISTANCE TO APPLICATION TURBINES - 846m

ORIENTATION OF VIEW - 90degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.

Proposed Wind Turbine
Not Visible from the
Community Hall



VIEW 5b - wireframe

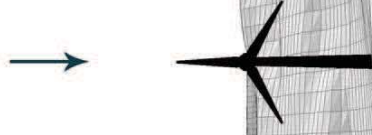
Looking north from Tigh Na Cnoc

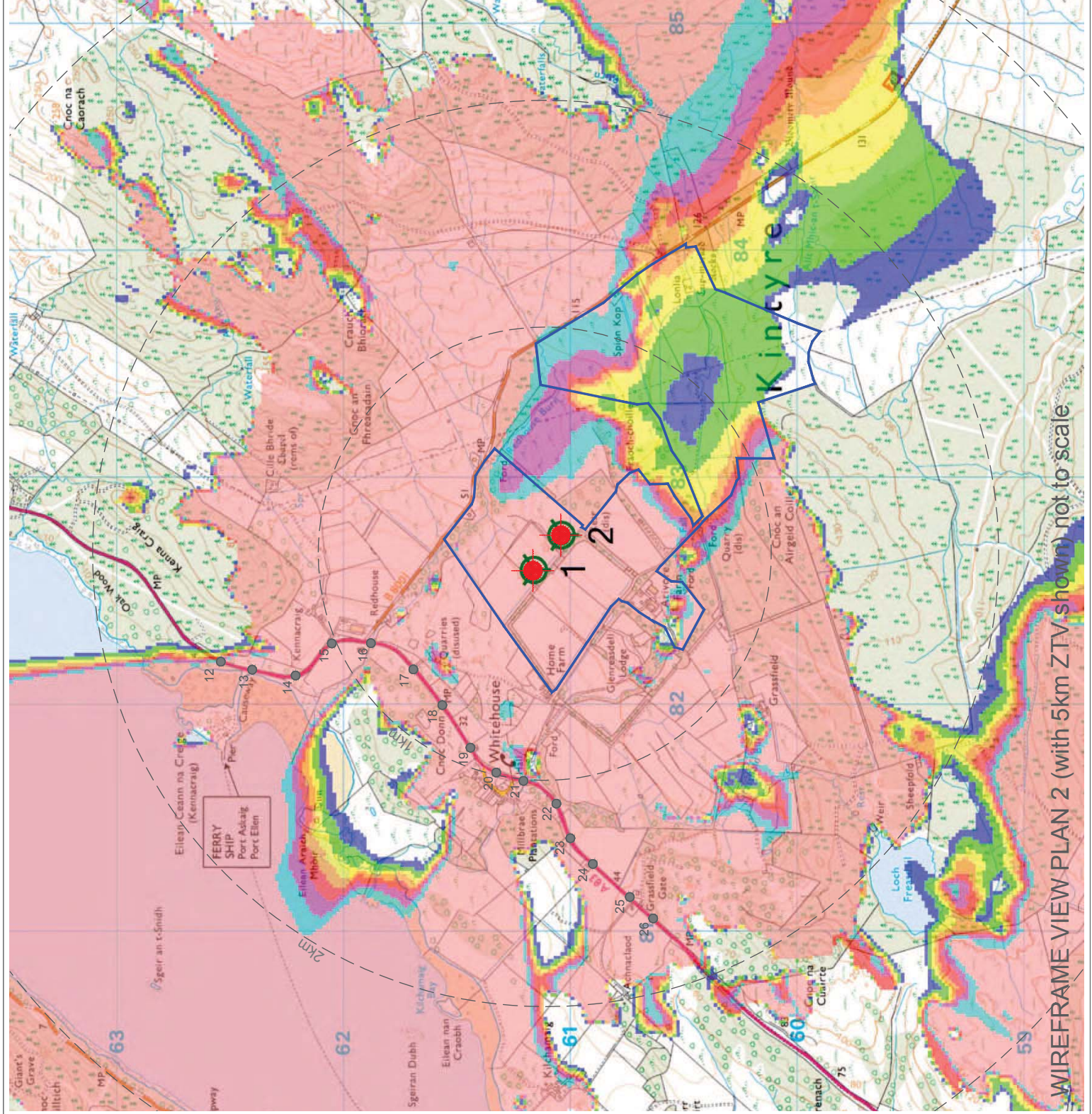
CO-ORDINATES OF VIEW POINT - 182573E, 660745N

DISTANCE TO APPLICATION TURBINES - 419m

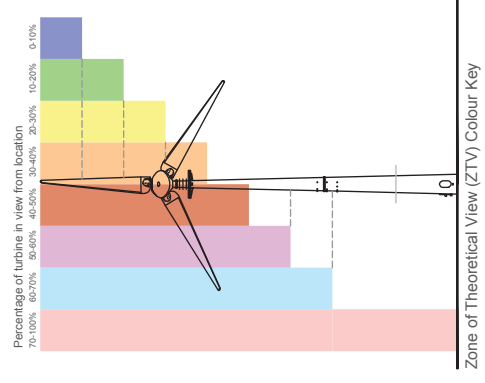
ORIENTATION OF VIEW - 5degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.





WIREFRAME VIEW PLAN 2 (with 5km ZTV shown) not to scale



REV	DATE	BY	REASON

	9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk
	PROJECT: Proposed Wind Turbine Installation CLIENT: Arvore, Whitehouse, Tarbert. ADDRESS: CENTRE OF SITE - 182664.9E, 661104N DRAWN BY: SS SCALE: N.T.S. DATE: 10/12/2013 TITLE: MONTAGE VIEWS & 5km ZTV

VIEW 12 - wireframe

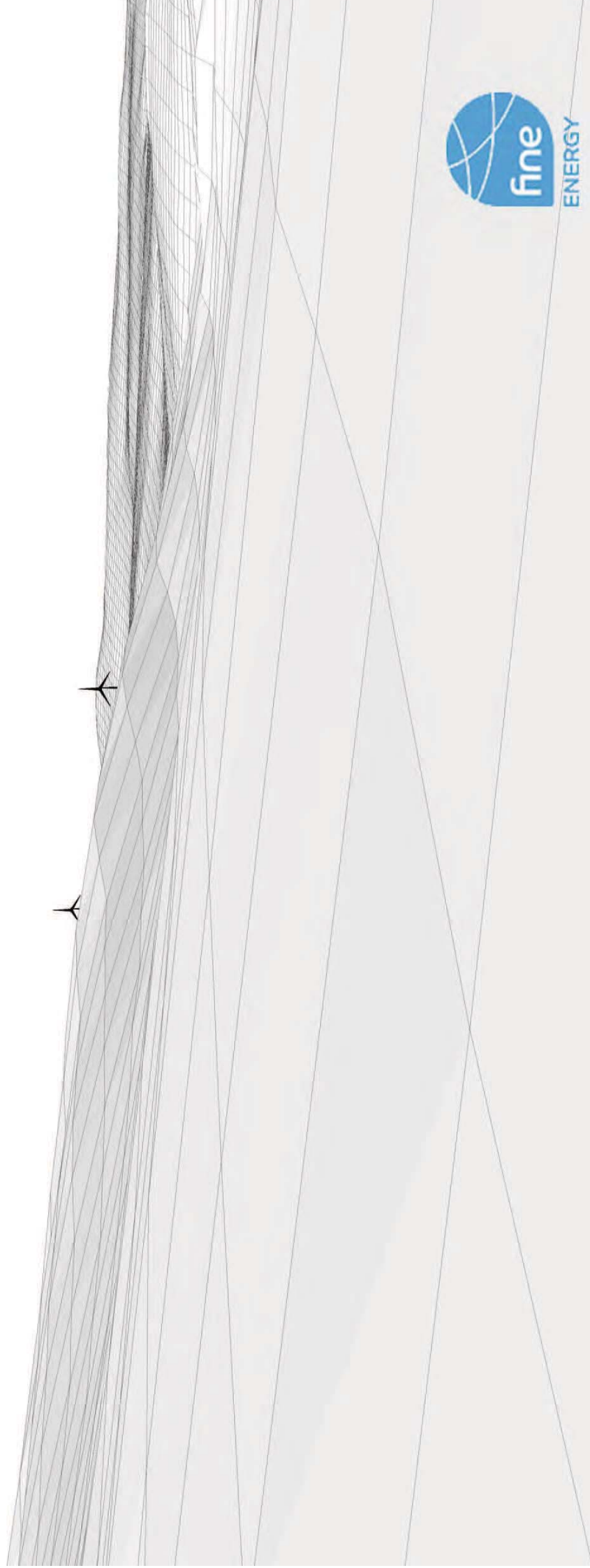
Looking south/southeast on the A83, 115m north of the entrance to Port Ellen

CO-ORDINATES OF VIEW POINT - 182186E, 662543N

DISTANCE TO APPLICATION TURBINES - 1.43Km

ORIENTATION OF VIEW - 162degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 13 - wireframe

Looking south/southeast on the A83 from the entrance to Port Ellen

CO-ORDINATES OF VIEW POINT - 182147E, 662410N

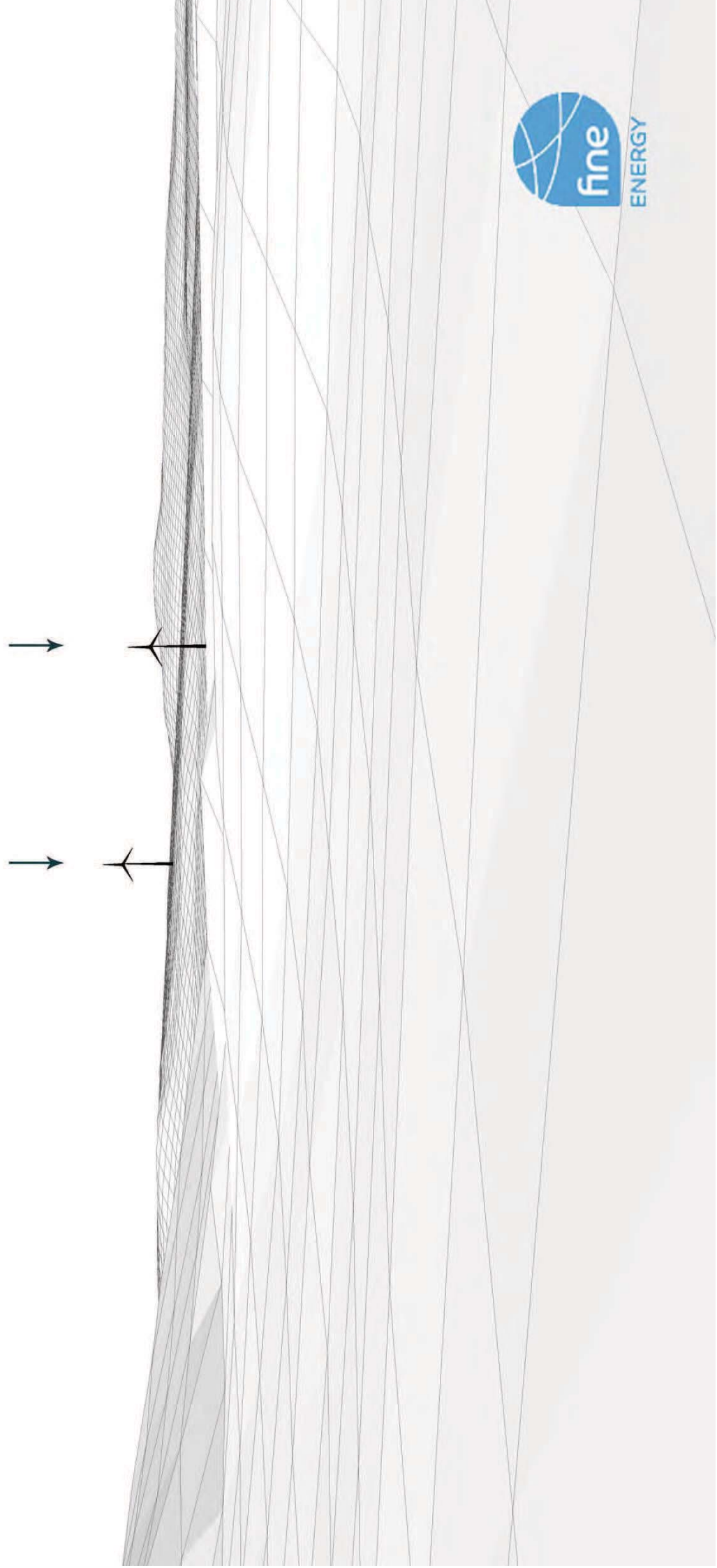
DISTANCE TO APPLICATION TURBINES - 1.31Km

ORIENTATION OF VIEW - 158degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 14 - wireframe

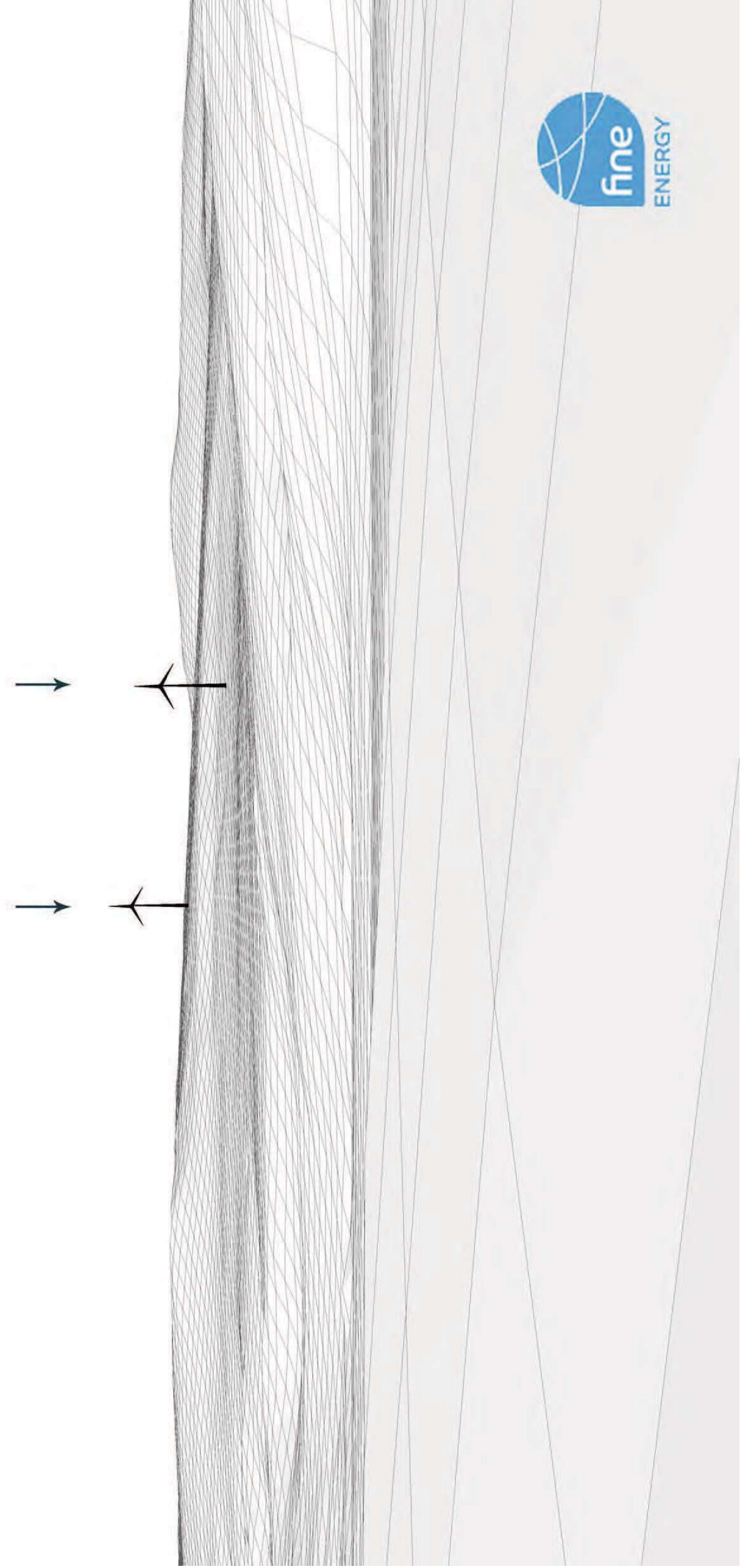
Looking southeast on the A83, 220m south of the entrance to Port Ellen

CO-ORDINATES OF VIEW POINT - 182139E, 662212N

DISTANCE TO APPLICATION TURBINES - 1.14Km

ORIENTATION OF VIEW - 155degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 15 - wireframe

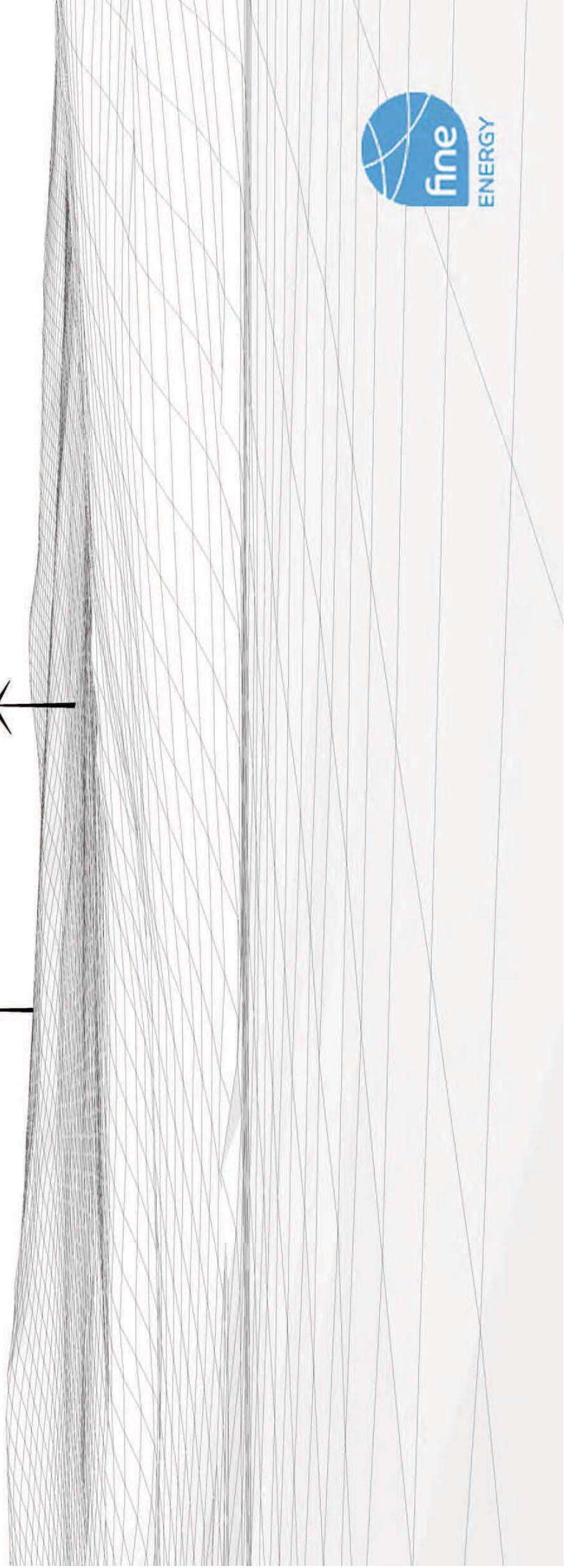
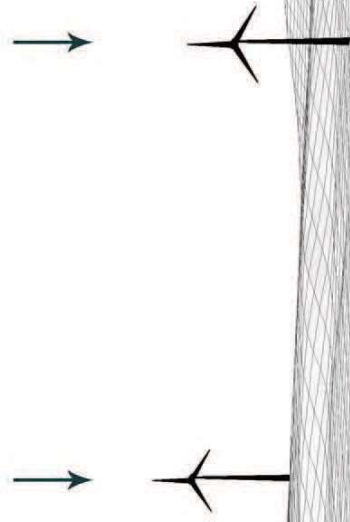
Looking southeast on the A83 from the entrance to Redhouse

CO-ORDINATES OF VIEW POINT - 182294E, 662040N

DISTANCE TO APPLICATION TURBINES - 943.6m

ORIENTATION OF VIEW - 160degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 16 - wireframe

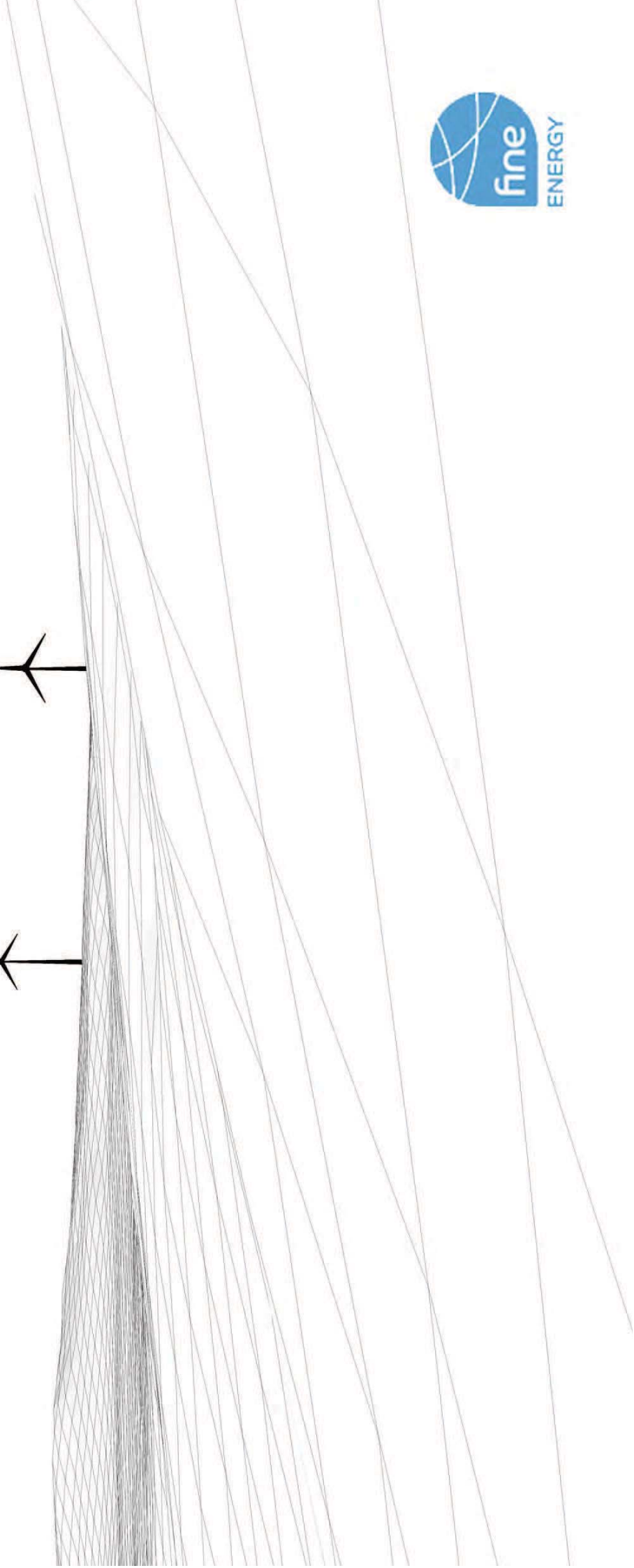
Looking southeast from the A83 / B8901 junction

CO-ORDINATES OF VIEW POINT - 182272E, 661846N

DISTANCE TO APPLICATION TURBINES - 782.7m

ORIENTATION OF VIEW - 153degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 17 - wireframe

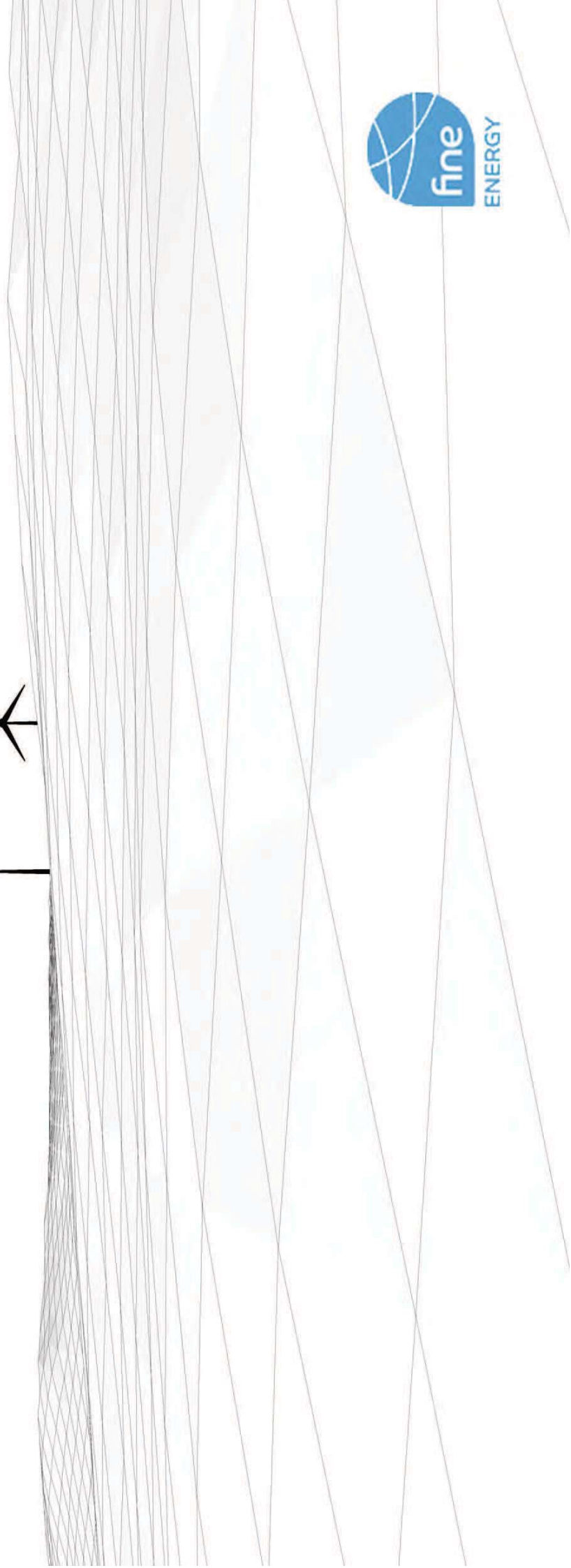
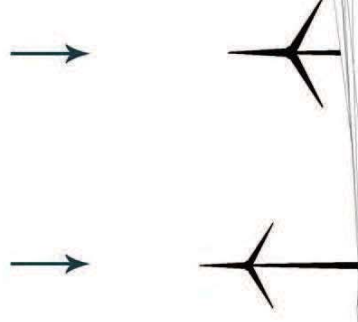
Looking southeast on the A83 from the entrance to local quarry

CO-ORDINATES OF VIEW POINT - 182161E, 661695N

DISTANCE TO APPLICATION TURBINES - 683.9m

ORIENTATION OF VIEW - 140degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 18 - wireframe

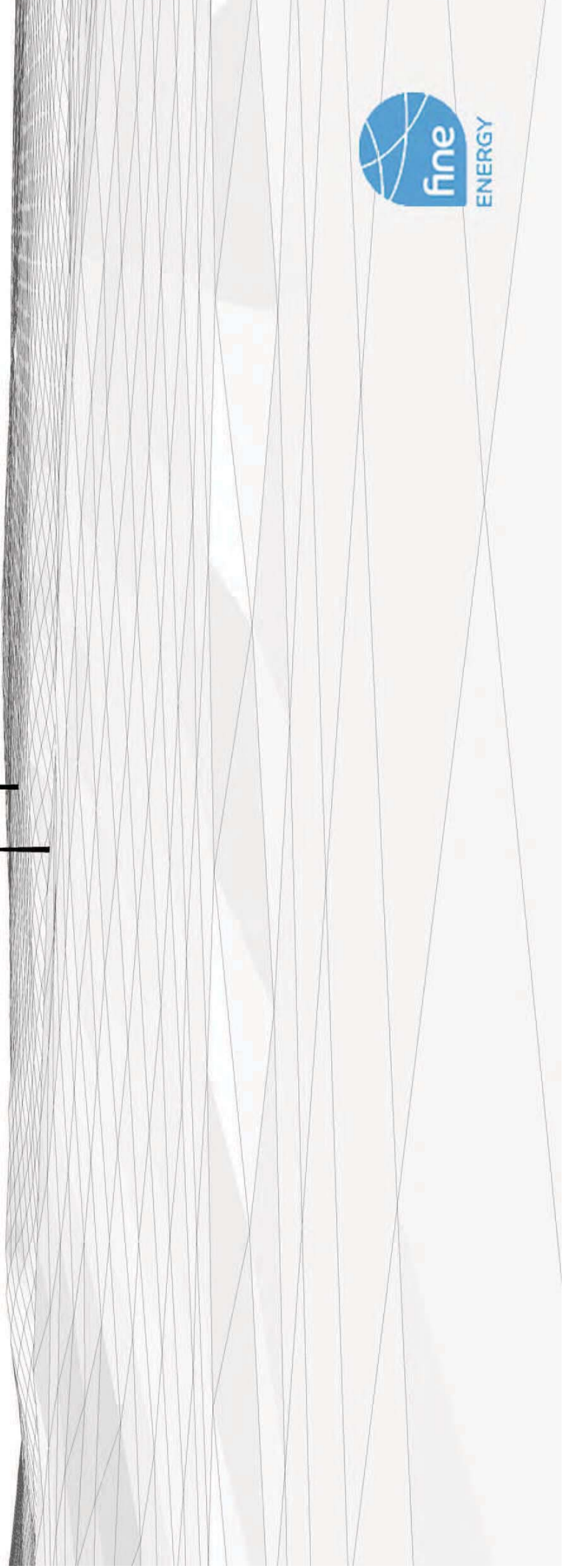
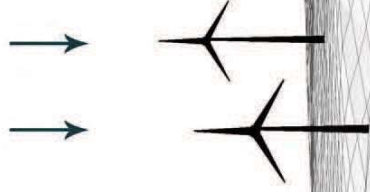
Looking east/southeast from the Mile Post on the A83

CO-ORDINATES OF VIEW POINT - 181996E, 661562N

DISTANCE TO APPLICATION TURBINES - 714.8m

ORIENTATION OF VIEW - 125degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 19 - wireframe

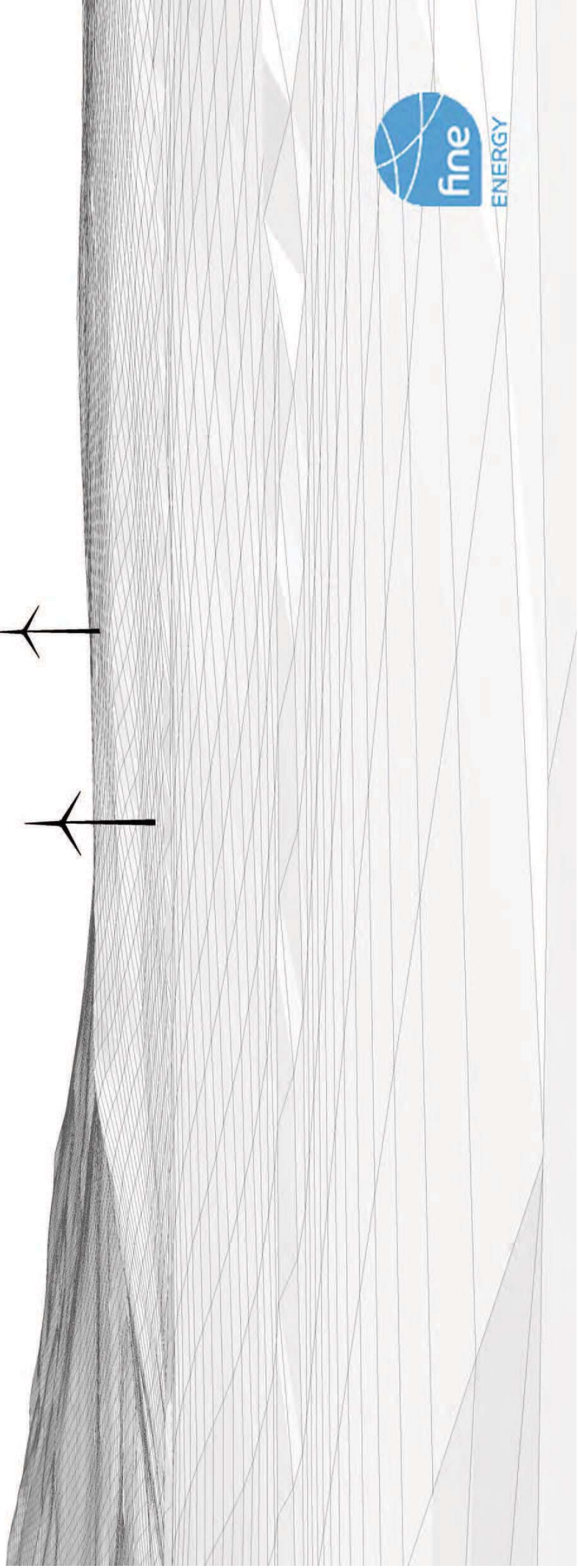
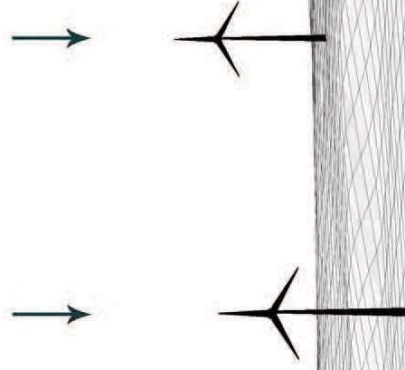
Looking east/southeast on the A83, 170m north of Whitehouse

CO-ORDINATES OF VIEW POINT - 181841E, 661457N

DISTANCE TO APPLICATION TURBINES - 828m

ORIENTATION OF VIEW - 112degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 20 - wireframe

Looking east on the A83 from Whitehouse

CO-ORDINATES OF VIEW POINT - 181705E, 661310N

DISTANCE TO APPLICATION TURBINES - 905.5m

ORIENTATION OF VIEW - 103degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 21 - wireframe

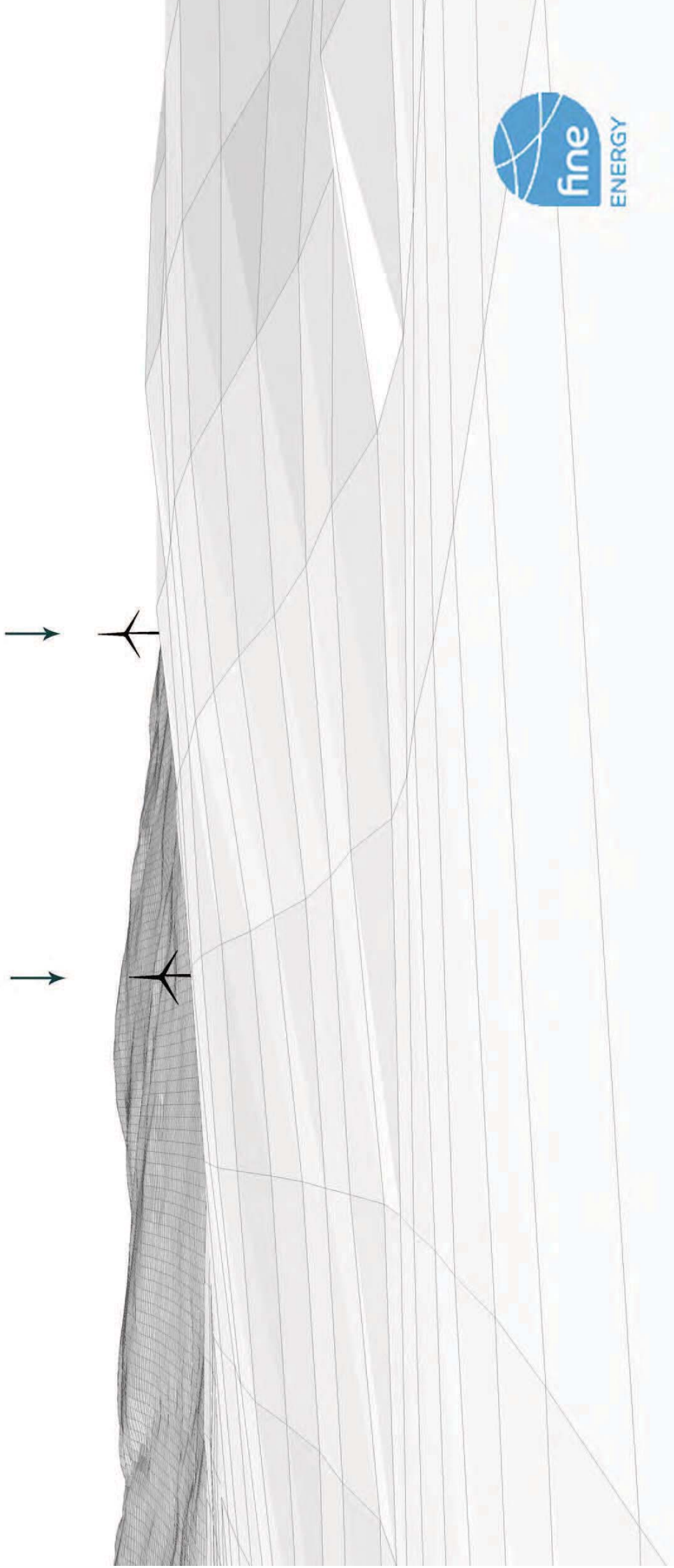
Looking east on the A83, 119m south of Whitehouse

CO-ORDINATES OF VIEW POINT - 181672E, 661206N

DISTANCE TO APPLICATION TURBINES - 928.6m

ORIENTATION OF VIEW - 96degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @ A4.



VIEW 22 - wireframe

Looking northeast on the A83, 224m south of Whitehouse

CO-ORDINATES OF VIEW POINT - 181550E, 661058N

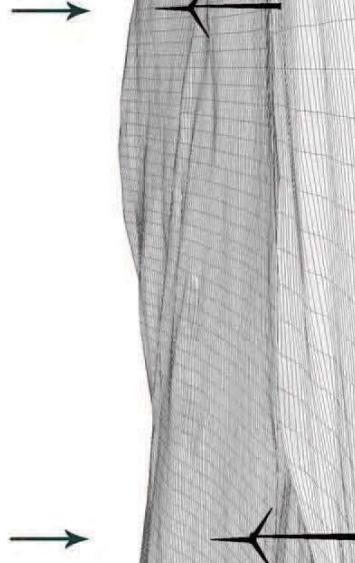
DISTANCE TO APPLICATION TURBINES - 1.03km

ORIENTATION OF VIEW - 89degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 23 - wireframe

Looking northeast on the A83 from the entrance to Millbrae Plantation

CO-ORDINATES OF VIEW POINT - 181395E, 660994N

DISTANCE TO APPLICATION TURBINES - 1.19km

ORIENTATION OF VIEW - 86degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 24 - wireframe

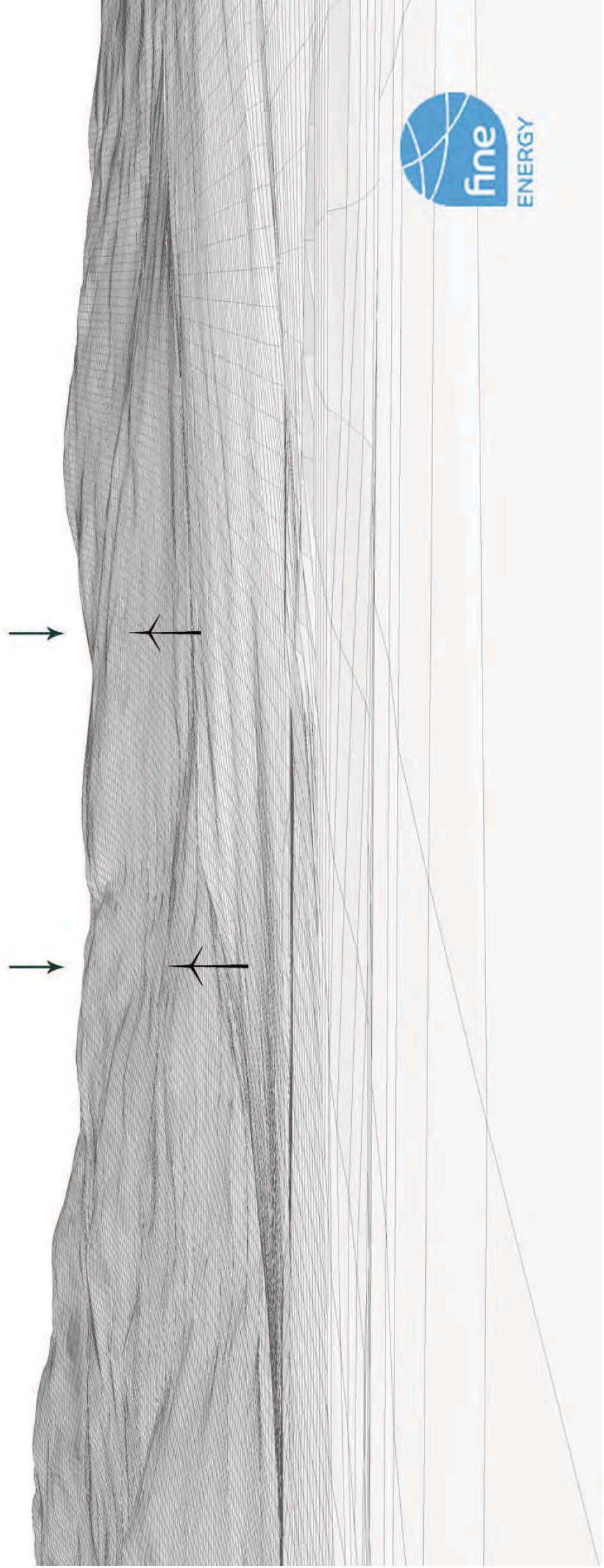
Looking northeast on the A83, 239m north of the entrance to Achacload

CO-ORDINATES OF VIEW POINT - 181288E, 660882N

DISTANCE TO APPLICATION TURBINES - 1.31km

ORIENTATION OF VIEW - 81degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 25 - wireframe

Looking northeast on the A83 from the entrance to Achmalcaod

CO-ORDINATES OF VIEW POINT - 181173E, 660756N

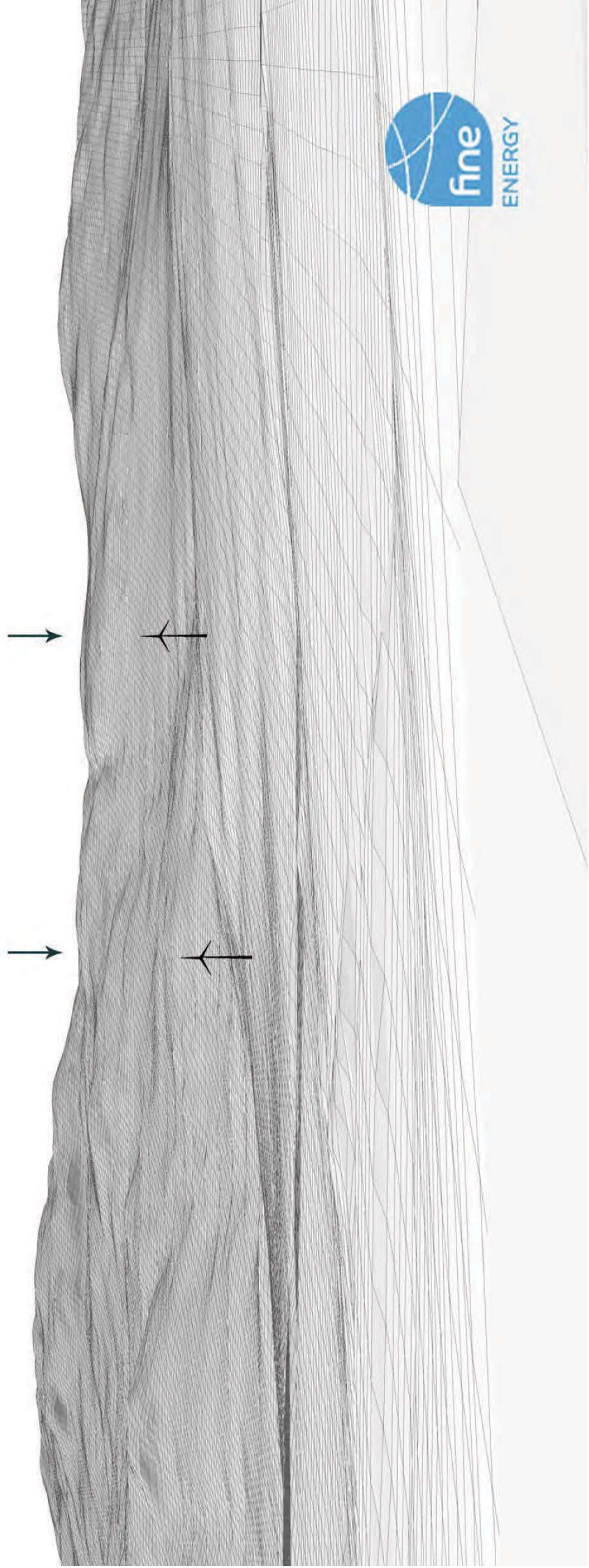
DISTANCE TO APPLICATION TURBINES - 1.50km

ORIENTATION OF VIEW - 77degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.



VIEW 26 - wireframe

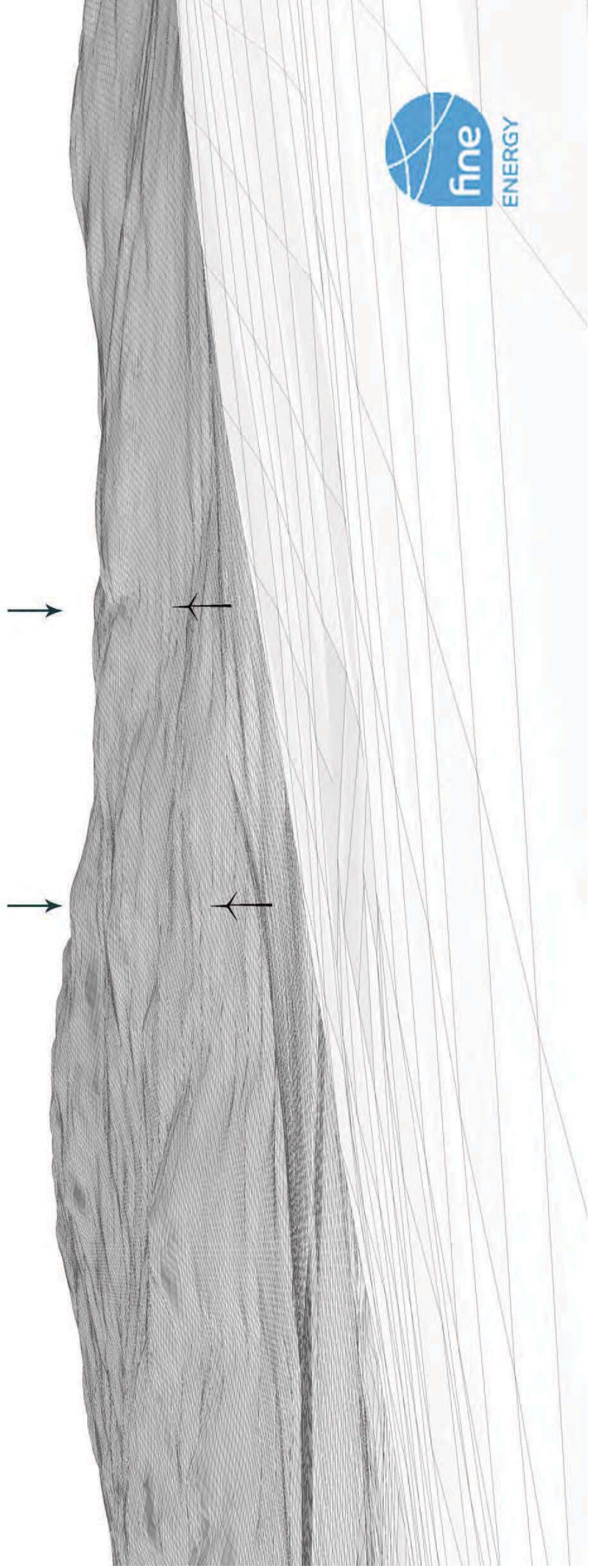
Looking northeast on the A83, 120m south of the entrance to Achnaclaod

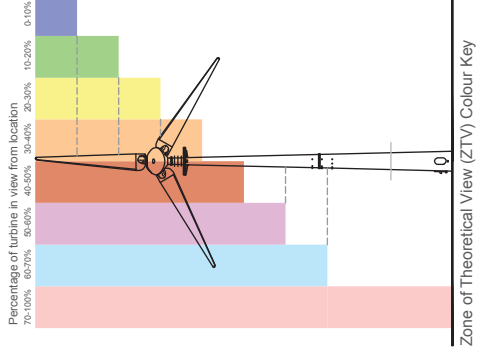
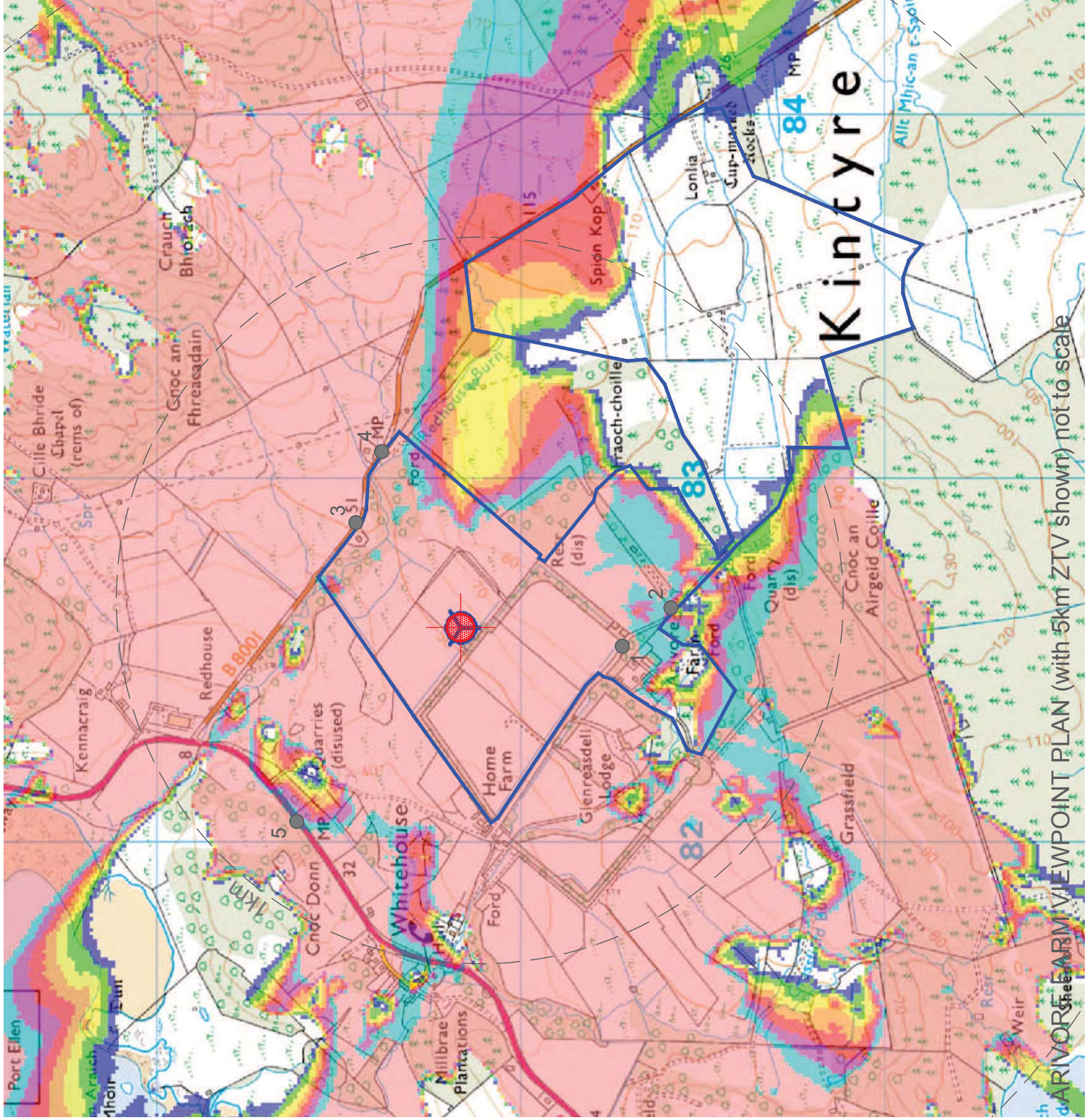
CO-ORDINATES OF VIEW POINT - 181007E, 660584N

DISTANCE TO APPLICATION TURBINES - 1.62km

ORIENTATION OF VIEW - 72degrees

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 500mm @ A3, 429mm @A4.





REV	DATE	BY	REASON
9 KINGSKNOWE PARK EDINBURGH EH14 2JQ T: 0131 443 0040 W: www.fineenergy.co.uk			
PROJECT:	Proposed Wind Turbine Installation		
CLIENT:	Arvore, Whitehouse, Tarbert.		
SITE / CO-ORD:	CENTRE OF SITE - 182588E, 661166N		
DRAWN BY:	SS	SCALE:	N.T.S.
TITLE:	VIEWPOINT PLAN & 5KM ZTV		DATE: 19/02/2014 DWG NO: VP02

ARVOR FARM VIEWPOINT PLAN (with 5km ZTV shown) not to scale

VIEW 1 - wireframe

Looking North/Northeast from the entrance to Tigh Nan Cnoc

CO-ORDINATES OF VIEW POINT - 182549E, 660727N

DISTANCE TO APPLICATION TURBINES - 440.7m

ORIENTATION OF VIEW - 6.5degrees

PHOTOGRAPH DATE - 18th Feb 2014 (12:48)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 1

Looking North/Northeast from the entrance to Tigh Nan Cnoc

CO-ORDINATES OF VIEW POINT - 182549E, 660727N

DISTANCE TO APPLICATION TURBINES - 440.7m

ORIENTATION OF VIEW - 6.5degrees

PHOTOGRAPH DATE - 18th Feb 2014 (12:48)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 2 - wireframe

Looking North from the entrance to Eriskay

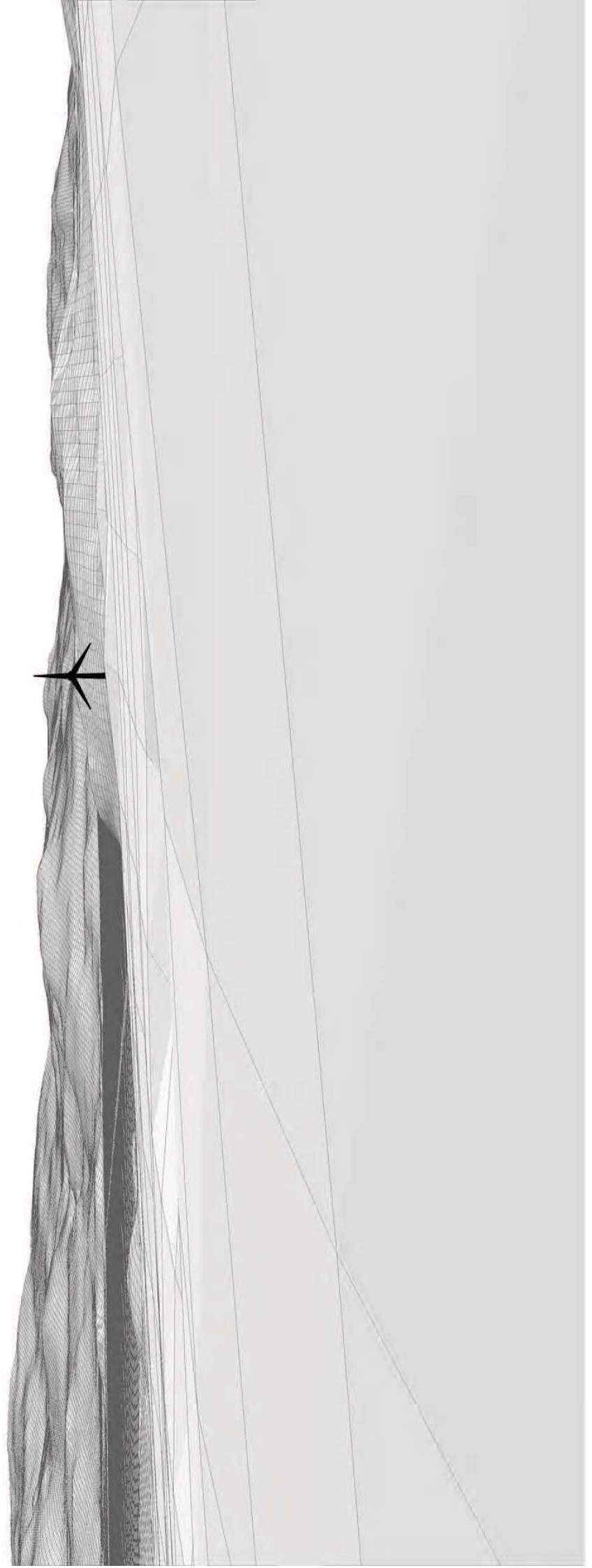
CO-ORDINATES OF VIEW POINT - 182648E, 660582N

DISTANCE TO APPLICATION TURBINES - 587m

ORIENTATION OF VIEW - 35.1degrees

PHOTOGRAPH DATE - 18th Feb 2014 (12:55)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.





VIEW 2

Looking North from the entrance to Eriskay

CO-ORDINATES OF VIEW POINT - 182648E, 660582N

DISTANCE TO APPLICATION TURBINES - 587m

ORIENTATION OF VIEW - 351degrees

PHOTOGRAPH DATE - 18th Feb 2014 (12:55)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 3 - wireframe

Looking South from the entrance to Taigh Na Cuilce

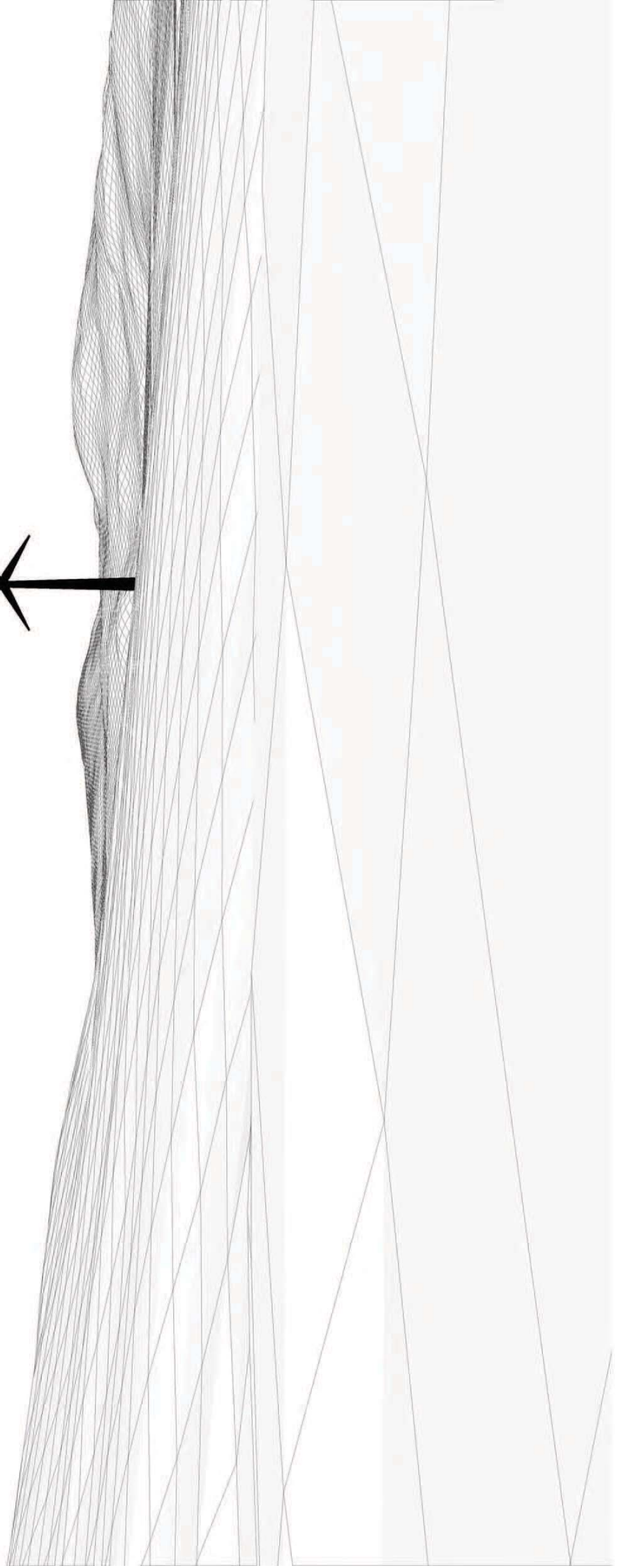
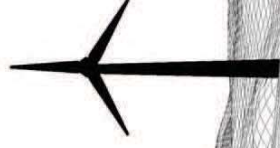
CO-ORDINATES OF VIEW POINT - 182888E, 661442N

DISTANCE TO APPLICATION TURBINES - 408m

ORIENTATION OF VIEW - 222degrees

PHOTOGRAPH DATE - 18th Feb 2014 (13:04)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 3

Looking South from the entrance to Taigh Na Cuilce

CO-ORDINATES OF VIEW POINT - 182888E, 661442N

DISTANCE TO APPLICATION TURBINES - 408m

ORIENTATION OF VIEW - 222degrees

PHOTOGRAPH DATE - 18th Feb 2014 (13:04)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 4 - wireframe

Looking South/Southwest from the entrance to Craig View

CO-ORDINATES OF VIEW POINT - 183053E, 661406N

DISTANCE TO APPLICATION TURBINES - 523m

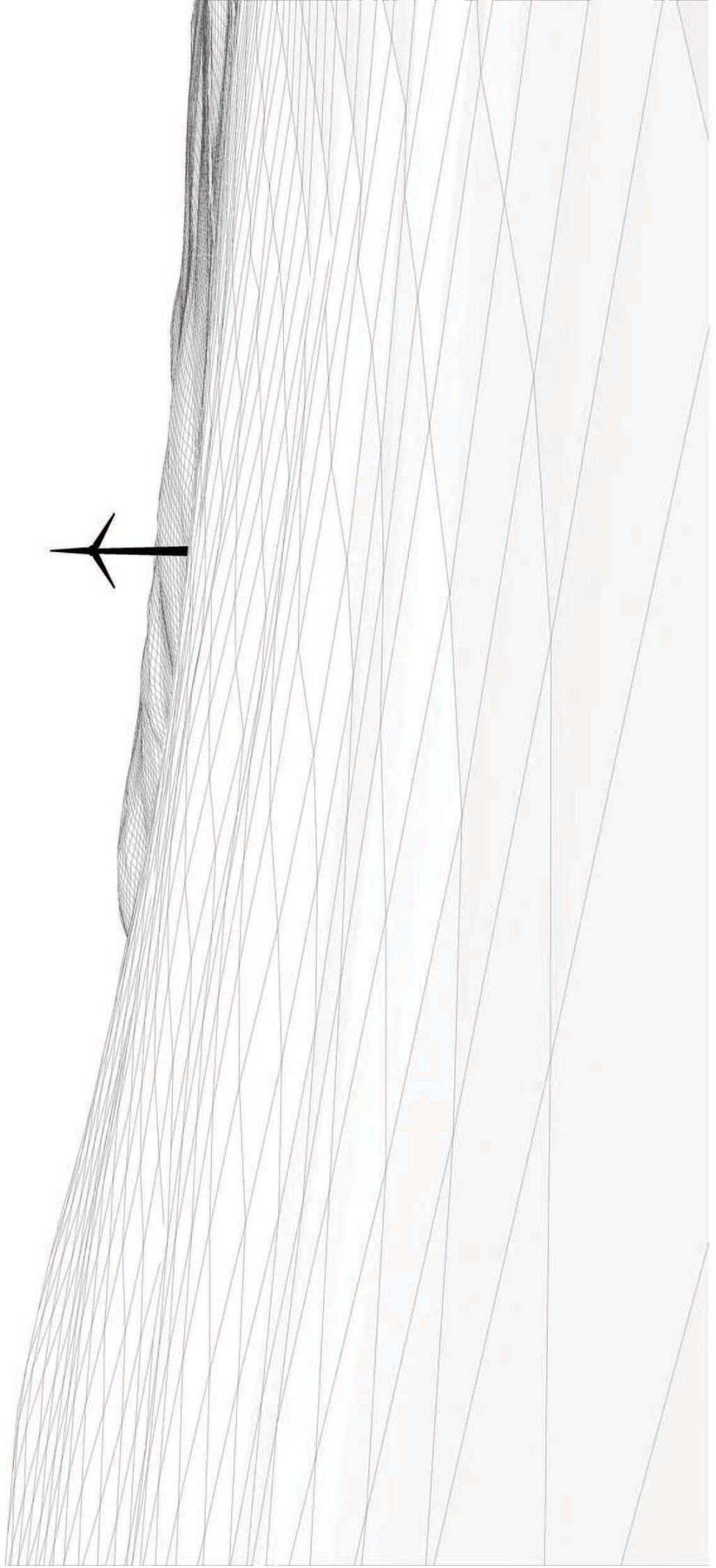
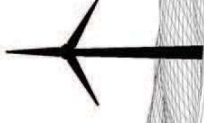
ORIENTATION OF VIEW - 237degrees

PHOTOGRAPH DATE - 18th Feb 2014 (13:07)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.





VIEW 4

Looking South/Southwest from the entrance to Craig View

CO-ORDINATES OF VIEW POINT - 183053E, 661406N

DISTANCE TO APPLICATION TURBINES - 523m

ORIENTATION OF VIEW - 237degrees

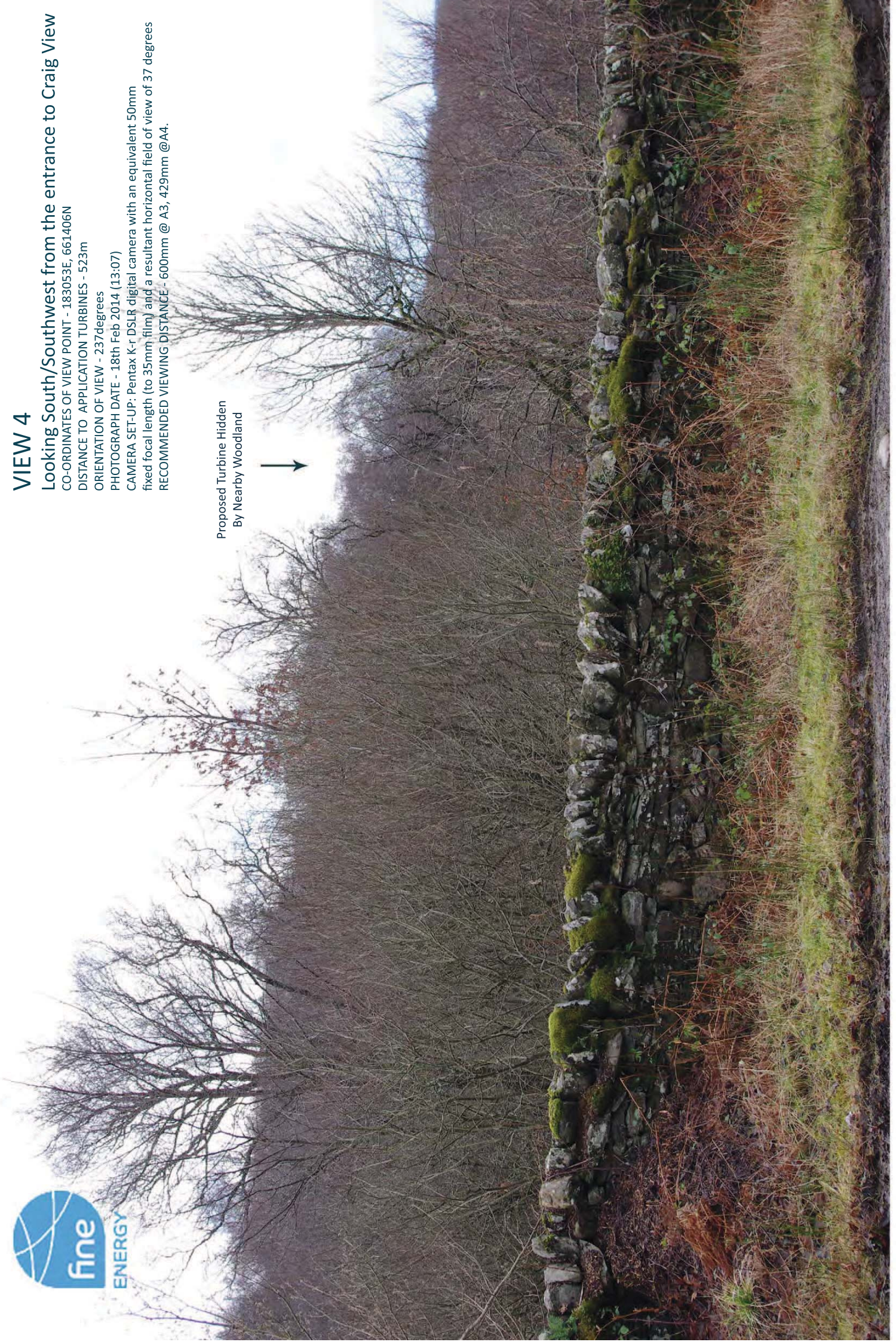
PHOTOGRAPH DATE - 18th Feb 2014 (13:07)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

Proposed Turbine Hidden
By Nearby Woodland



VIEW 5 - wireframe

Looking East from the A83/Quarry

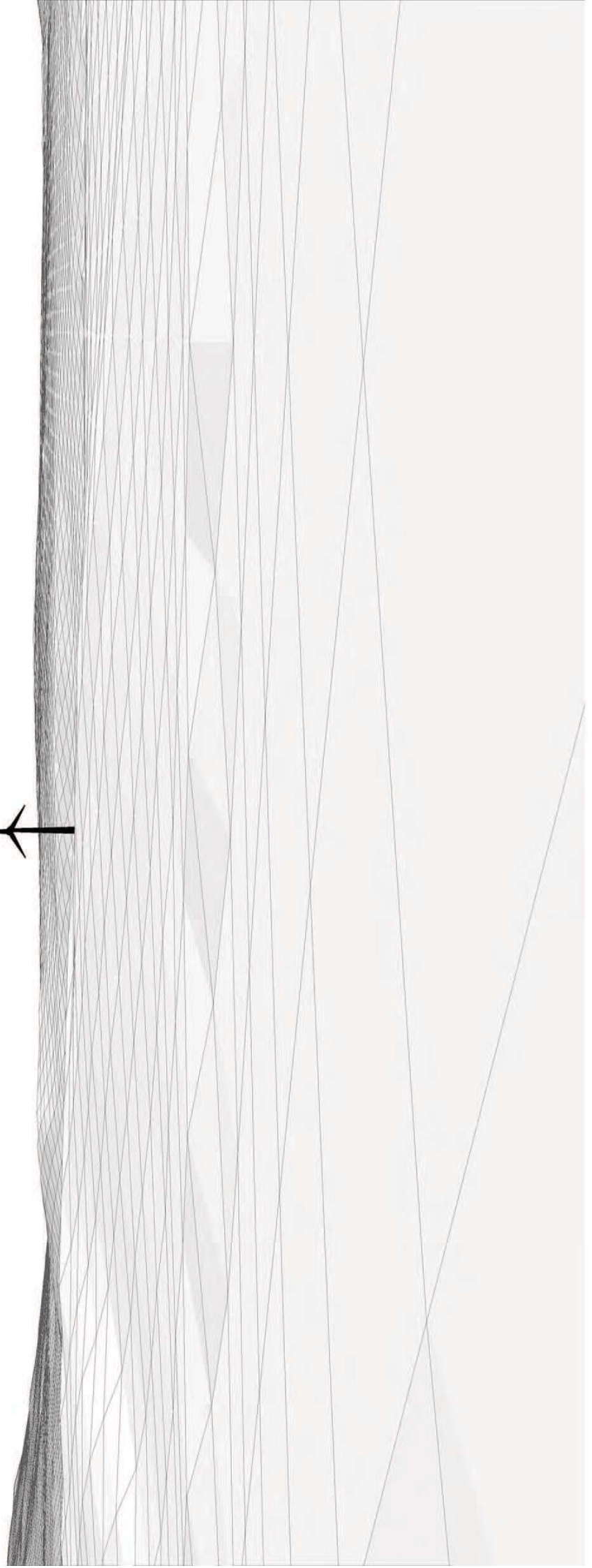
CO-ORDINATES OF VIEW POINT - 181985E; 661555N

DISTANCE TO APPLICATION TURBINES - 717m

ORIENTATION OF VIEW - 124degrees

PHOTOGRAPH DATE - 18th Feb 2014 (13:17)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 5

Looking East from the A83/Quarry

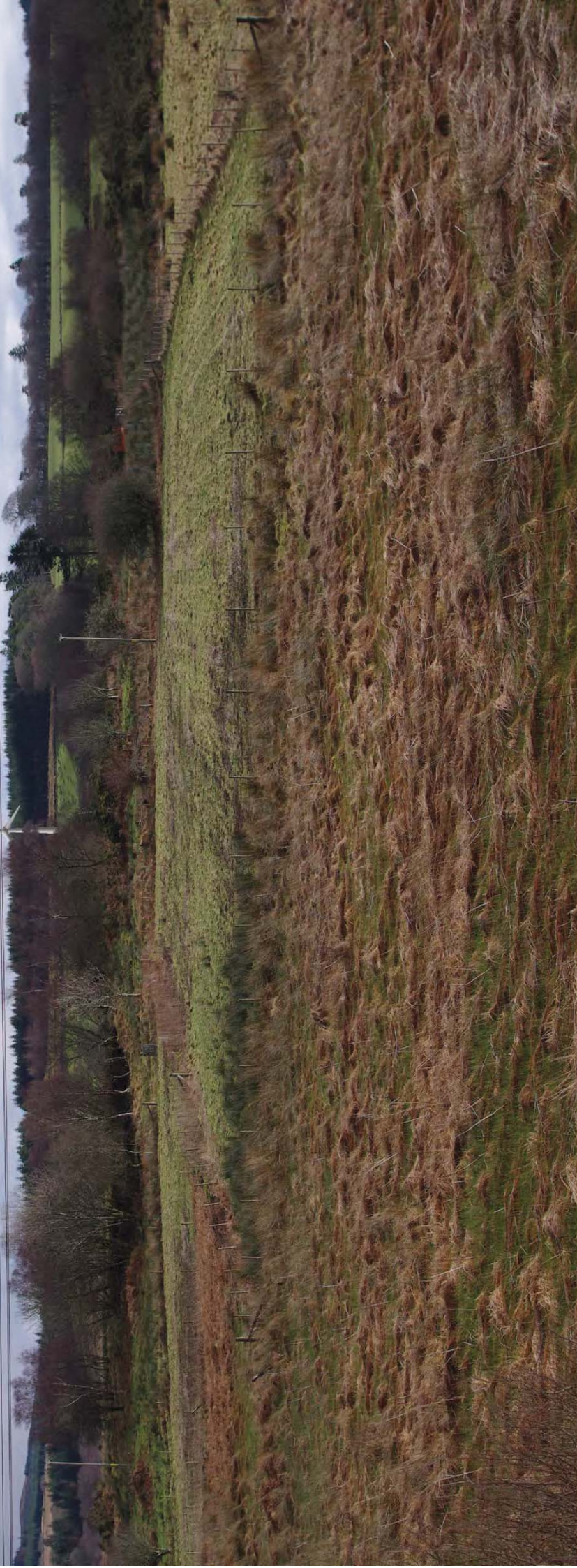
CO-ORDINATES OF VIEW POINT - 181985E, 661555N

DISTANCE TO APPLICATION TURBINES - 717m

ORIENTATION OF VIEW - 124degrees

PHOTOGRAPH DATE - 18th Feb 2014 (13:17)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 37 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.





VIEW 1 - wireframe

Looking east from Dalmore House

CO-ORDINATES OF VIEW POINT - 178996E, 661438N

DISTANCE TO APPLICATION TURBINES - 3.6Km

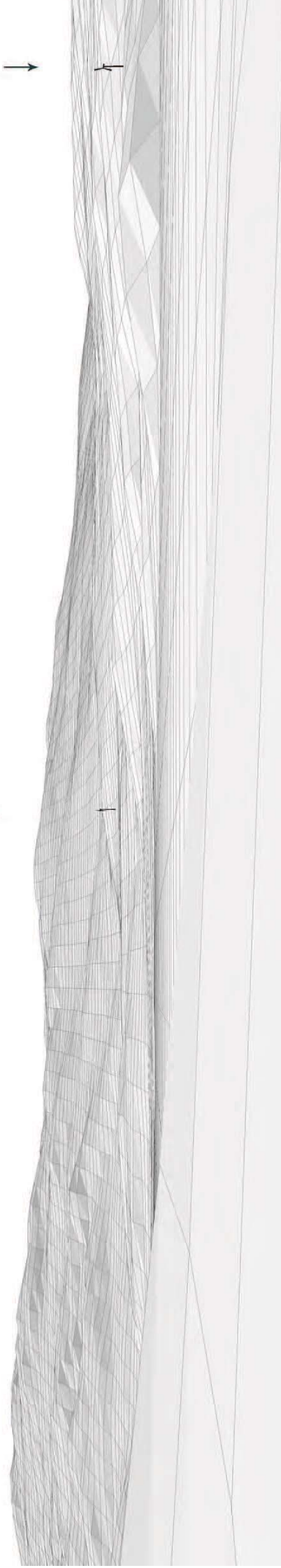
ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (14:09)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

1no. 23.8m turbine @
Kilmahaig Farm, Tarbert
Ref: 12/00241/PP
Status: Granted





VIEW 1

Looking east from Dalmore House

CO-ORDINATES OF VIEW POINT - 178996E, 661438N

DISTANCE TO APPLICATION TURBINES - 3.6Km

ORIENTATION OF VIEW - +00degrees

PHOTOGRAPH DATE - 28th May 2013 (14:09)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

VIEW 2 - wireframe

Looking east from Tigh Na Traich

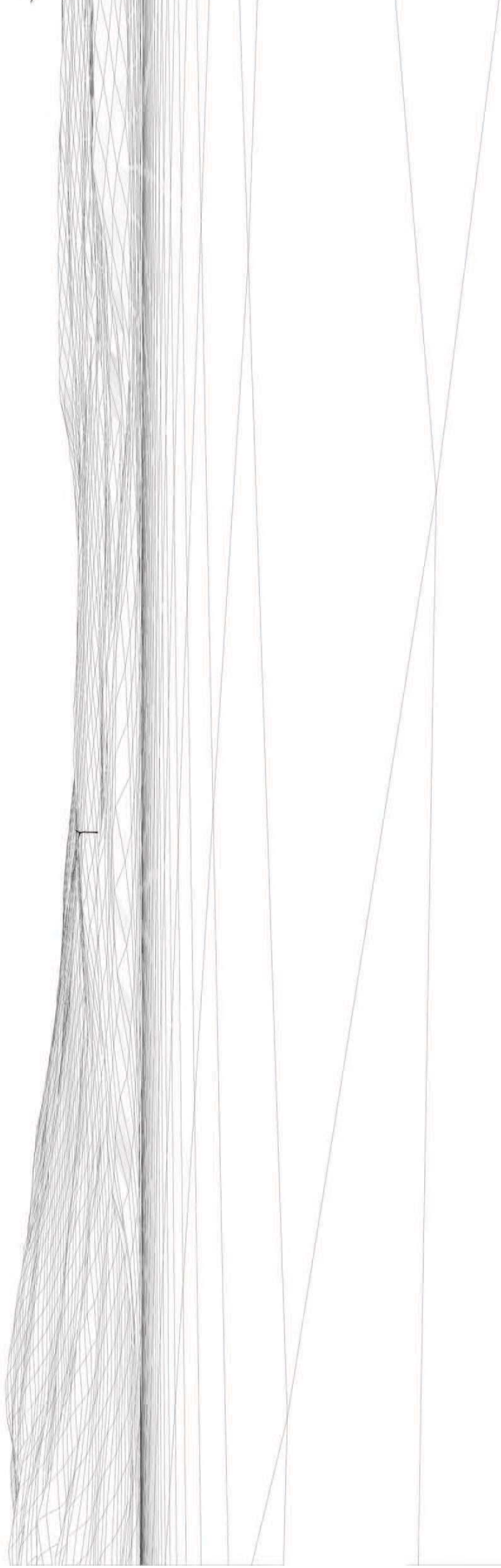
CO-ORDINATES OF VIEW POINT - 179976E, 662568N

DISTANCE TO APPLICATION TURBINES - 3.05Km

ORIENTATION OF VIEW - 135degrees

PHOTOGRAPH DATE - 28th May 2013 (13:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 2 - wireframe

Looking east from Tigh Na Traich

CO-ORDINATES OF VIEW POINT - 179976E, 662568N

DISTANCE TO APPLICATION TURBINES - 3.05Km

ORIENTATION OF VIEW - 135degrees

PHOTOGRAPH DATE - 28th May 2013 (13:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 3 - wireframe

Looking southeast from Port Askaig

CO-ORDINATES OF VIEW POINT - 181964E, 662568N

DISTANCE TO APPLICATION TURBINES - 1.47Km

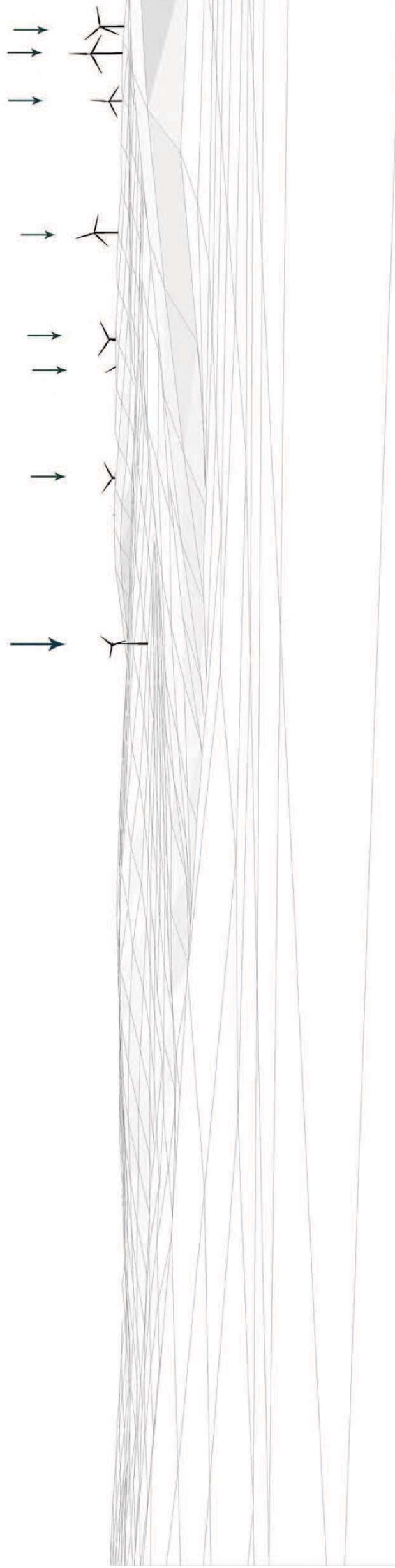
ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:26)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

11no. 100m turbine @

Freasdail Wind Farm, Whitehouse
status: Pending



VIEW 3

Looking southeast from Port Askaig

CO-ORDINATES OF VIEW POINT - 181964E, 662568N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:26)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

11no. 100m turbine @

Freasdail Wind Farm, Whitehouse

status: Pending





VIEW 4 - wireframe

Looking east from Bluebell Cottage

CO-ORDINATES OF VIEW POINT - 182473E, 661750N

DISTANCE TO APPLICATION TURBINES - 720m

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:34)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

11no. 100m turbine @
Freasdail Wind Farm, Whitehouse
status: Pending



VIEW 4

Looking east from Bluebell Cottage

CO-ORDINATES OF VIEW POINT - 182473E, 661750N

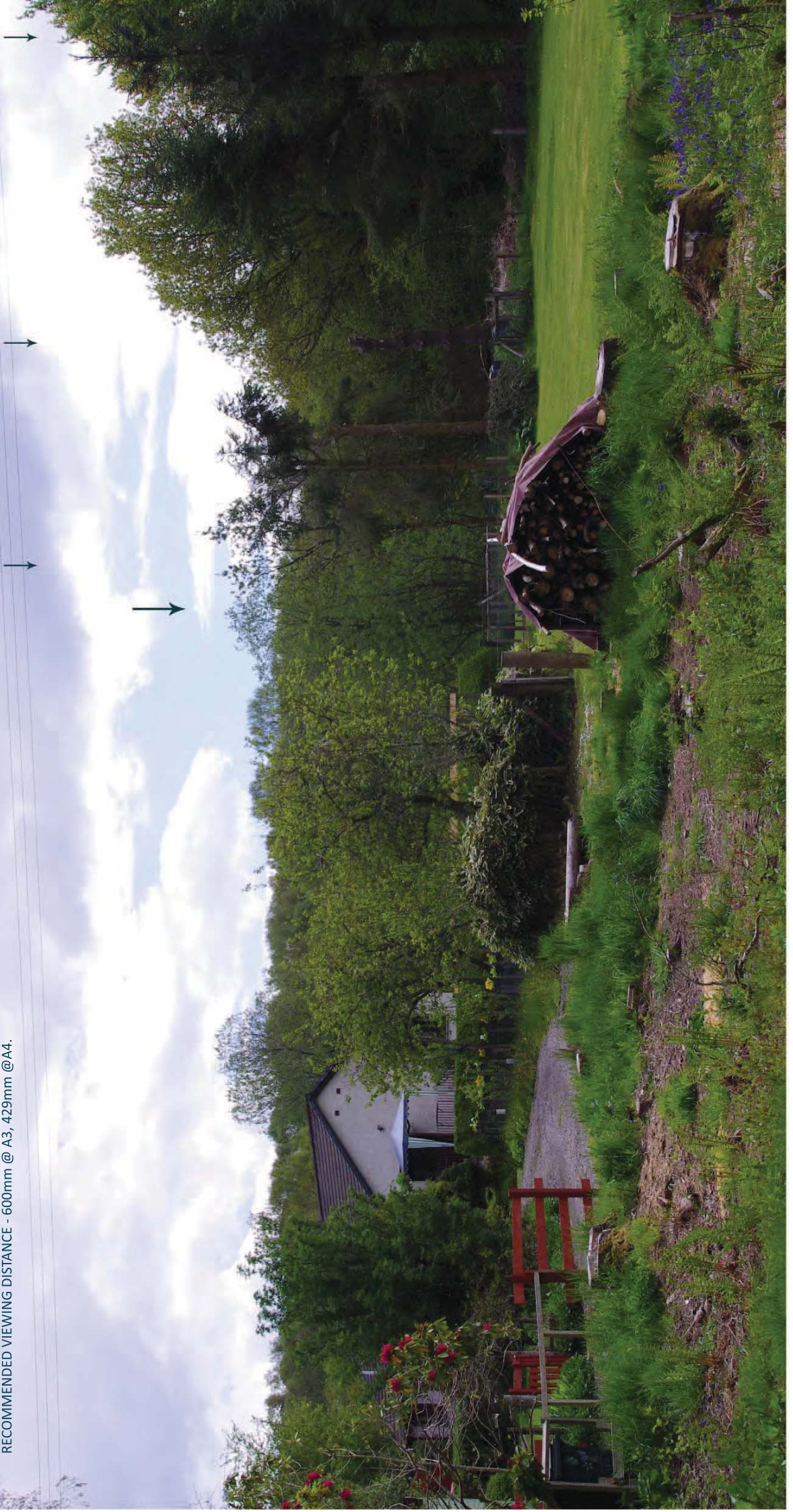
DISTANCE TO APPLICATION TURBINES - 700m

ORIENTATION OF VIEW - 170degrees

PHOTOGRAPH DATE - 28th May 2013 (12:34)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

11no. 100m turbine @
Freasdail Wind Farm, Whitehouse
status: Pending



VIEW 5 - wireframe

Looking east from Whitehouse

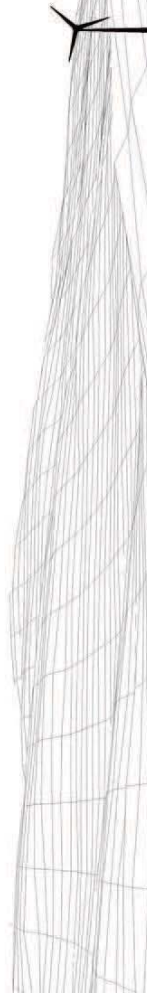
CO-ORDINATES OF VIEW POINT - 181720E, 661378N

DISTANCE TO APPLICATION TURBINES - 989m

ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (12:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 5

Looking east from Whitehouse

CO-ORDINATES OF VIEW POINT - 181720E, 661378N

DISTANCE TO APPLICATION TURBINES - 989m

ORIENTATION OF VIEW - 100degrees

PHOTOGRAPH DATE - 28th May 2013 (12:58)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 6 - wireframe

Looking Northeast, near Home Farm

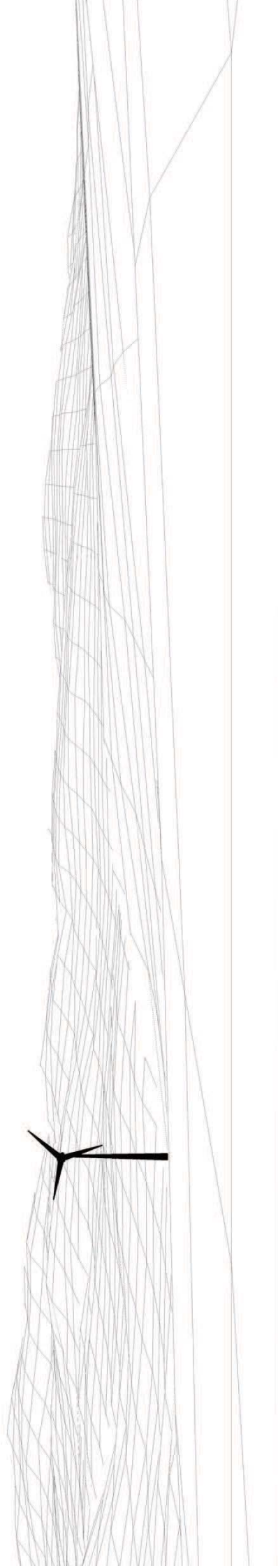
CO-ORDINATES OF VIEW POINT - 182106E, 661016N

DISTANCE TO APPLICATION TURBINES - 544m

ORIENTATION OF VIEW - 85degrees

PHOTOGRAPH DATE - 28th May 2013 (13:02)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 6

Looking Northeast near Home Farm

CO-ORDINATES OF VIEW POINT - 182106E, 661016N

DISTANCE TO APPLICATION TURBINES - 540m

ORIENTATION OF VIEW - 85degrees

PHOTOGRAPH DATE - 28th May 2013 (13:02)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 7 - wireframe

Looking Northeast from Glenreasdell Lodge

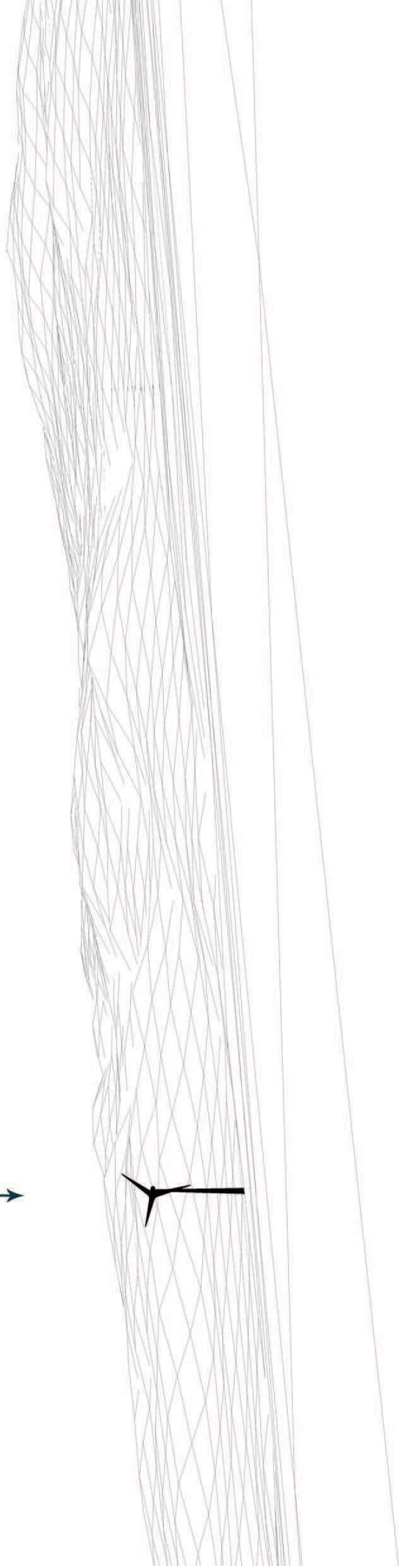
CO-ORDINATES OF VIEW POINT - 182257E, 660725N

DISTANCE TO APPLICATION TURBINES - 467m

ORIENTATION OF VIEW - 47degrees

PHOTOGRAPH DATE - 28th May 2013 (13:13)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 7

Looking Northeast from Glenreadsell Lodge

CO-ORDINATES OF VIEW POINT - 182257E, 660725N

DISTANCE TO APPLICATION TURBINES - 467m

ORIENTATION OF VIEW - 47degrees

PHOTOGRAPH DATE - 28th May 2013 (13:13)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 8 - wireframe

Looking East from the A83

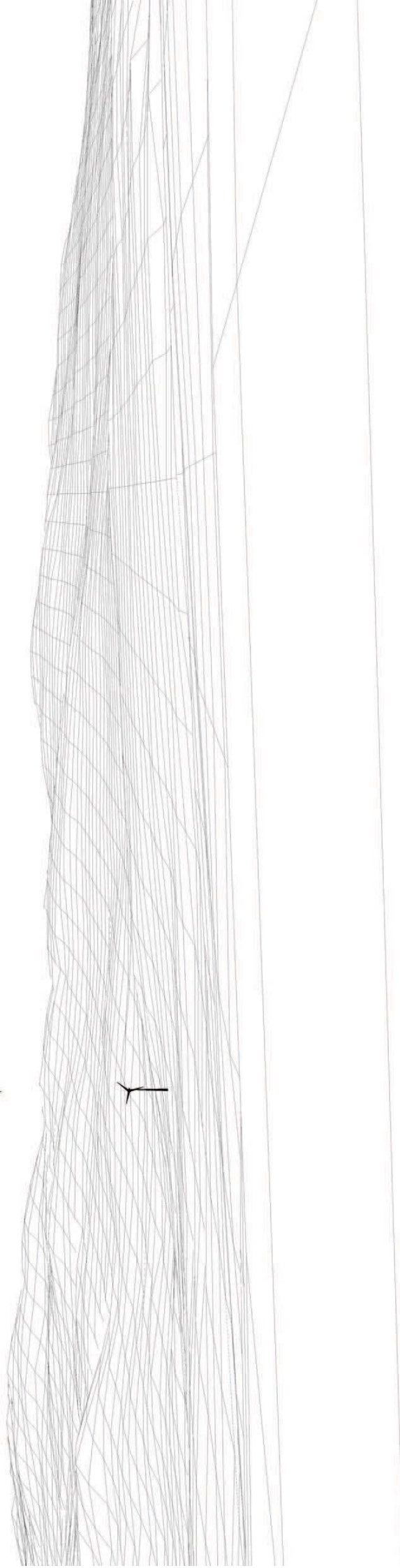
CO-ORDINATES OF VIEW POINT - 181223E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 79degrees

PHOTOGRAPH DATE - 28th May 2013 (13:19)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 8

Looking East from the A83

CO-ORDINATES OF VIEW POINT - 181223E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.47Km

ORIENTATION OF VIEW - 79degrees

PHOTOGRAPH DATE - 28th May 2013 (13:19)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 9 - wireframe

Looking Northwest from Spion Kop

CO-ORDINATES OF VIEW POINT - 183778E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.28Km

ORIENTATION OF VIEW - 283degrees

PHOTOGRAPH DATE - 28th May 2013 (12:40)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

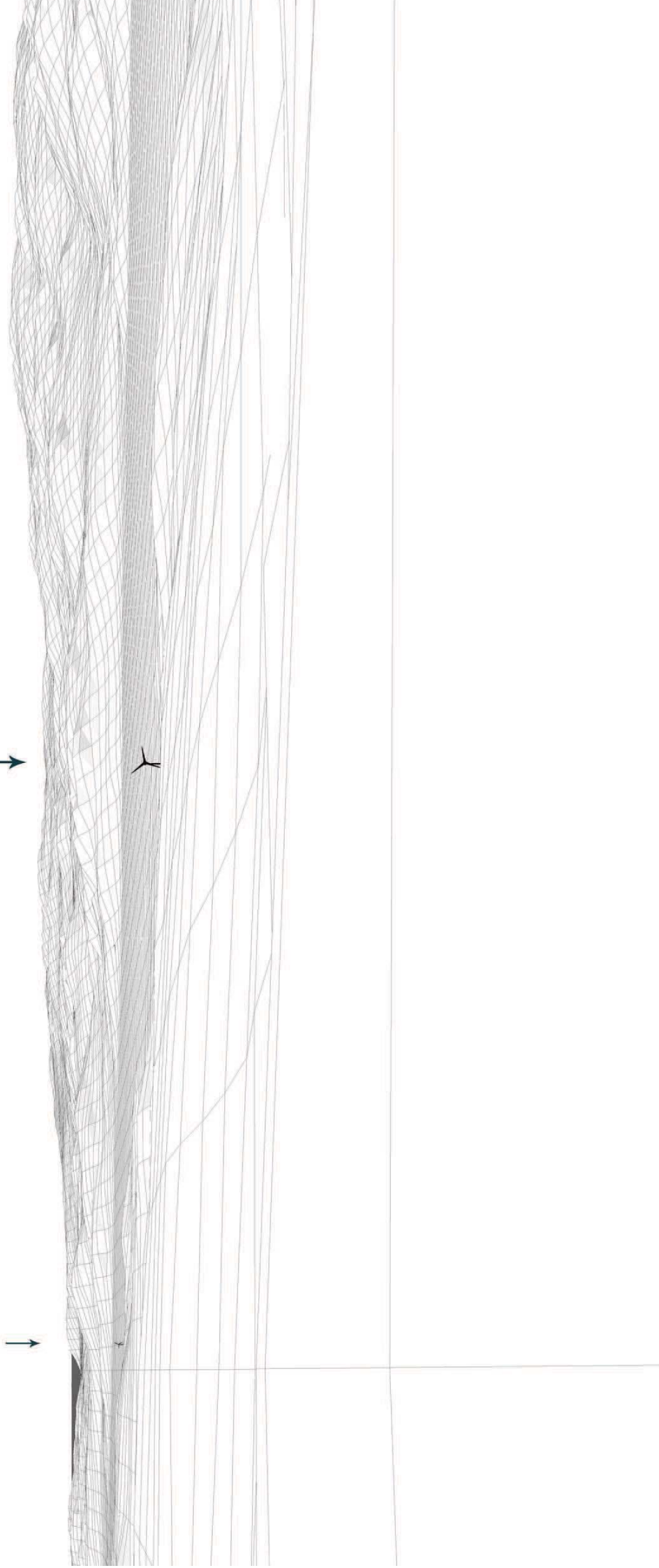
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.

1no. 23.8m turbine @

Kilchamaig Farm, Tarbert

Ref: 12/00241/PP

Status: Granted



VIEW 9

Looking Northwest from Spion Kop

CO-ORDINATES OF VIEW POINT - 183778E, 660807N

DISTANCE TO APPLICATION TURBINES - 1.28Km

ORIENTATION OF VIEW - 283degrees

PHOTOGRAPH DATE - 28th May 2013 (12:40)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm

fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 10 - wireframe

Looking Northwest from the B8001

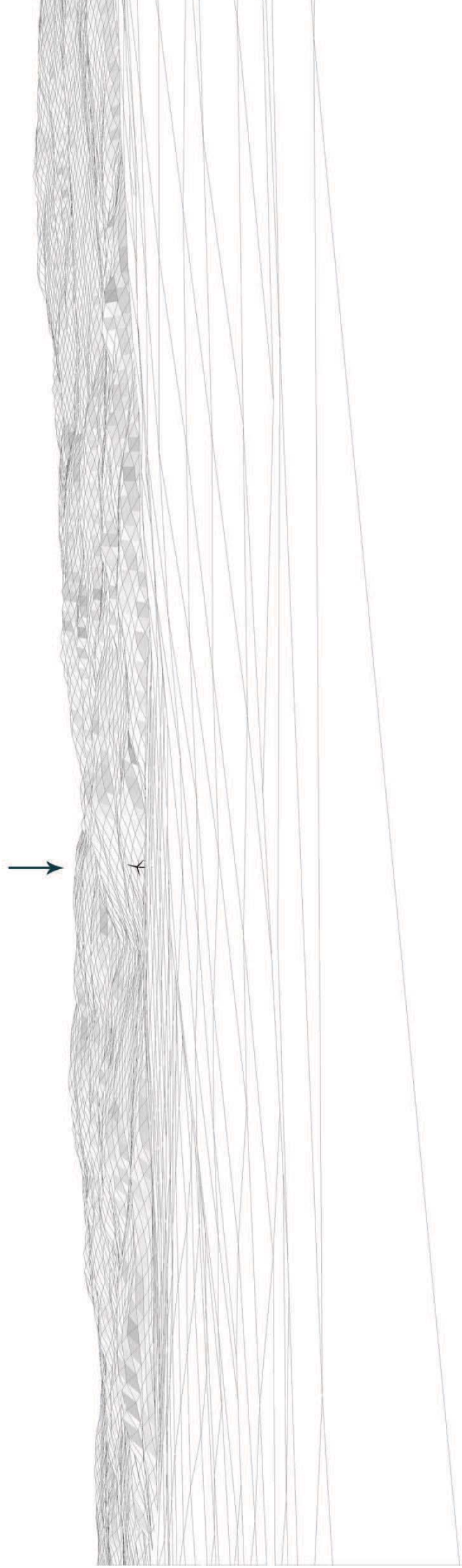
CO-ORDINATES OF VIEW POINT - 184469E, 659822N

DISTANCE TO APPLICATION TURBINES - 2.2Km

ORIENTATION OF VIEW - 306degrees

PHOTOGRAPH DATE - 28th May 2013 (12:44)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees
RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.



VIEW 10

Looking Northwest from the B8001

CO-ORDINATES OF VIEW POINT - 184469E, 659822N

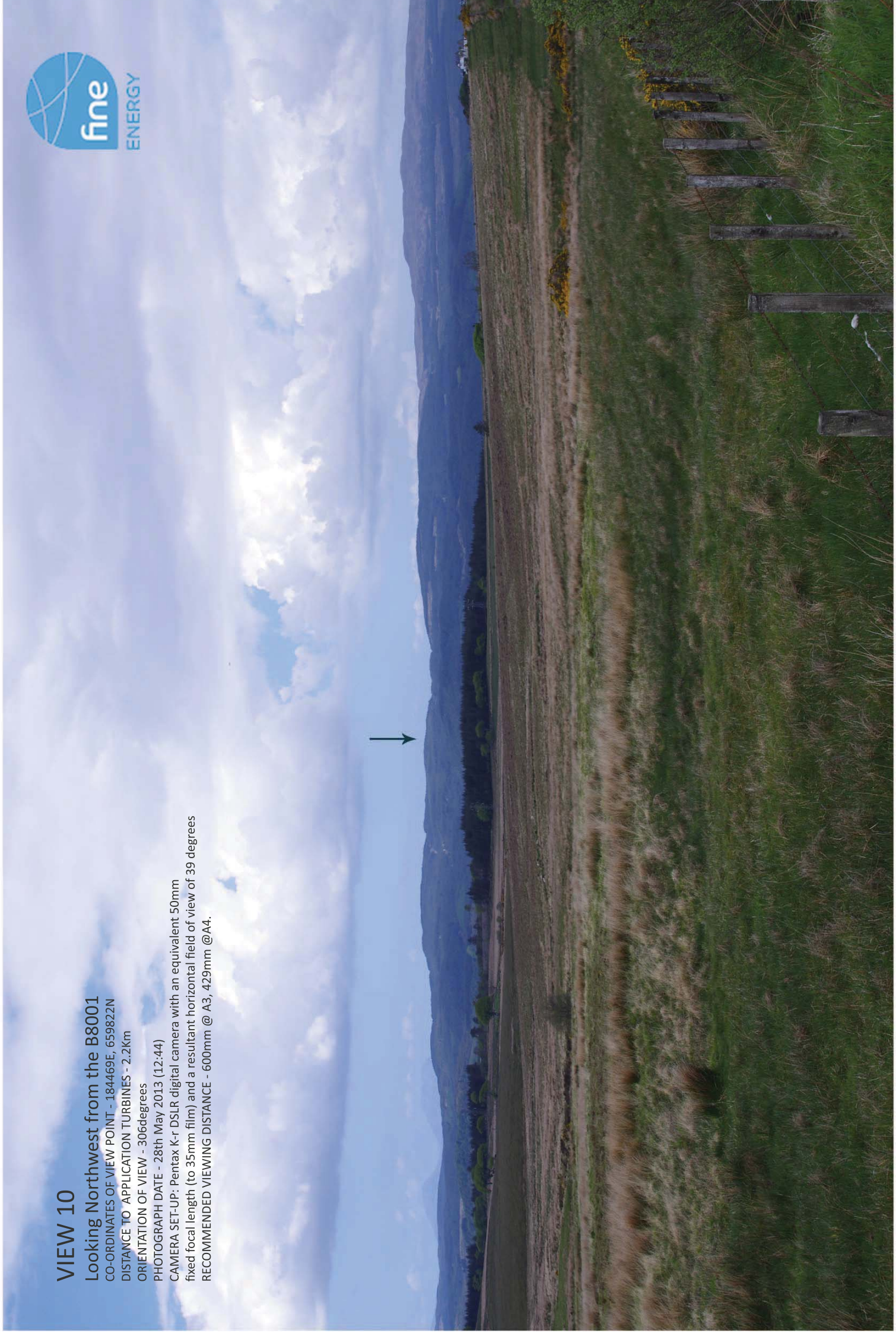
DISTANCE TO APPLICATION TURBINES - 2.2Km

ORIENTATION OF VIEW - 306degrees

PHOTOGRAPH DATE - 28th May 2013 (12:44)

CAMERA SET-UP: Pentax K-r DSLR digital camera with an equivalent 50mm fixed focal length (to 35mm film) and a resultant horizontal field of view of 39 degrees

RECOMMENDED VIEWING DISTANCE - 600mm @ A3, 429mm @A4.





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Tel: 0131 443 0040
www.fineenergy.co.uk

11th December 2013

FAO: David Love
Senior Planning Officer,
Development Management
Argyll & Bute Council,
Kilmory,
Lochgilphead,
Argyll,
PA31 8RT

Dear Mr Love,

**PLANNING APPLICATION FOR ERECTION OF 2 no. SMALL SCALE WIND
TURBINES AT ARIVORE FARM, WHITEHOUSE, TARBERT, PA29 6XR – 13 /
02164 / PP**

I am writing in response to your email dated the 4th December 2013 and my reply sent on the same day.

Please find attached a series of wireframes which show the progression along the A83 length within the ZTV from approximately 115m north of the entrance to Port Ellen (Wireframe 12) to 120m south of the entrance to Achnaclaud (Wireframe 26). It should be acknowledged that the wireframes depict the 'worst possible view' without any mitigating factors such as built form, individual trees and / or hedgerows, scrub cover, tree groups, shelterbelts and woodland blocks.

Wireframes 19 – 21 in particular depict the 'impact' from the setting of Whitehouse, a very small settlement which faces towards an access road which feeds from the A83 itself. An area of land, which is approximately 60 metres in width, sits between the access road and the A83, which has a small degree of landscape resource within. Without taking into account the existing prevailing vegetation structure the wireframes show the prevailing landform which increases the mitigation provided from this stretch of the A83.

From the individual properties themselves in Whitehouse to the proposed site, there is an approximate distance of 970 metres (taken from google earth) with an approximate rise of 40 metres in elevation. Between the properties and the proposed site there are a number of individual trees and gorse over scrub land (approximate distance of 510 metres) and two mature shelterbelts delineating field boundaries thereafter. It is considered that there may be a 'degree of wind damaged vegetation', but not to the extent that all this existing landscape resource will be lost, thereby removing the screening effect (evident in Photomontage 5 which forms part of the application documents) from the edge of Whitehouse. It could be argued that if the wind in the area is to such a degree to cause



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substantial 'wind damage' then there would be significantly less trees within the prevailing landscape structure than what is currently there. In this regard therefore it is considered that the proposal does indeed conform to the Councils Wind Energy Study (CWES) and that the development does not impact on the setting of Whitehouse in such a detrimental way, if indeed at all, to use this as a reason for a recommendation for refusal.

It is acknowledged that there is a small degree of height variation between the two turbines, primarily due to the rising nature of the land where the turbines are proposed to be sited. The turbines have to be sited to take into account the access as well as the noise and topple separation distances required. It is considered that while there is the necessary degree of distance between the two turbines and the small variation in height level of the rotor blades, it is still viewed as 'one development'.

It should be noted that to the south of the setting of Whitehouse and along the A83 to the edge of the ZTV, as depicted in wireframes 22 – 26, the turbines are set against the rising landform within the 'rocky mosaic' character area. Those receptors using the A83 have between themselves on the road and the proposed site, a strong established hierarchy of landscape structure including woodland and shelterbelt planting delineating field boundaries as well as planting along the A83 itself and the access road to Glenreasdell Lodge and Arivore Farm. This existing landscape resource effectively provides mitigation for the receptors view and 'perceived impact'. This has been further presented in Photomontage 8, which forms part of the original application document pack.

I trust the above provides further information on addressing the concerns that the council has on the 'impact' on Whitehouse and its setting. As the applicant it is considered that the screening from the A83 is a 'suitable argument' and that the council's view in this stance is not justified in recommending refusal.

I look forward to hearing from you in due course.

Yours sincerely

A handwritten signature in black ink, reading "Lee Suzanne Houghton".

Lee Suzanne Houghton

cc. Mrs Margaret Dewar – Arivore Farm

From: Lee Houghton [Lee.Houghton@fineenergy.co.uk]
Sent: 13 February 2014 12:30
To: Love, David
Subject: RE: 13 / 02164 / PP - Arivore Farm
Attachments: Arivore Farm - Additional Viewpoint Visualisations.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Dear David,

Following the receipt of your email and our earlier telephone conversation today please find attached a number of visualisations to aid the determination of the above application.

As discussed, with time being of utmost priority, it would not have been acceptable for us to travel to take yet further photomontages from the two properties on B8001 (ref: 1b and 2b), another from A83 (ref 17) and immediately south of the site (ref 5b). I have therefore had my colleague produce a set of visuals which show the view from google earth and directly below a visual which shows where the turbine will be located and its height. Unfortunately we are unable to overlap the two images but reading them together will give a clear impression of the perceived impact that may occur and indeed where mitigation will be provided.

With regards to Viewpoint 5b, 'streetview' was not attainable for this location. We therefore overlaid the 'arc' that would be created using a 50mm and 70mm camera lens, in compliance with the 'Guidance with Visualisation Standards for Wind Energy Development' May 2013. The aspect of the house is not in the direct sight line of the proposed turbine, there is a degree of screening provided by the existing vegetation structure and there is an elevation difference of approximately 20 metres.

As part of the compromise on our part we have amended the application to a single turbine, but we will not be in a position to explore shorter tower options.

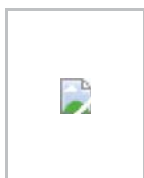
I think we have provided enough information now to date and feel that you now have everything required to make a decision on this application. I would be grateful if this could be done by close of tomorrow if at all possible. Both myself and the landowner have been patient and very accommodating but now require closure on this.


I look forward to hearing from you in due course.

Regards

Lee

Lee Suzanne Houghton, Project Manager, BSc(Hons), MLA
07951586337



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From: Love, David [<mailto:David.Love@argyll-bute.gov.uk>]

Sent: 10 February 2014 14:34

To: Lee Houghton

Subject: RE: 13 / 02164 / PP - Arivore Farm

Morning Lee,

Thanks for your patience in this matter.

I've had the chance to discuss with Peter and we both agree that we're generally in favour of this amended proposal but we still have one or two concerns regarding impact. I think the additional photomontages we asked for (references 1b, 2b and 5b and 17) might resolve our concerns.

I am concerned about how large the turbine appears from the Skipness Road and viewpoint 17 and it might be that the wireframes are making the turbine appear worse than it actually will be.

I am keen to resolve this application positively but in order to do so the above information is required. Once received I would aim to provide a response as a matter of priority but it might be that we may ask you to explore shorter tower options but would only do so if we felt we could not support the existing proposal.

I appreciate the above may be frustrating but please be advised that this application is a priority item to resolve and in principle we are generally supportive of the proposal.

Kind regards,

David

From: Lee Houghton [<mailto:Lee.Houghton@fineenergy.co.uk>]

Sent: 30 January 2014 10:28

To: Love, David

Subject: 13 / 02164 / PP - Arivore Farm

Dear David,

Please find attached the following for the above application amended to as single turbine development

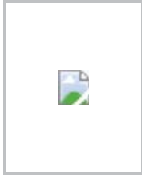
proposal (the location is confirmed as being the same as the lower turbine in the original application):

- Viewpoints 1 – 5 (Photomontages and wireframes – single turbine); and
- Viewpoints 6 -10 (Photomontages and wireframes – single turbine).

Regards

Lee

Lee Suzanne Houghton, Project Manager, BSc(Hons), MLA
07951586337



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From: Love, David
Sent: 25 February 2014 16:07
To: 'Lee Houghton'
Cc: Bain, Peter (Planning)
Subject: Arrivore Farm, Whitehouse

Lee,

Thank you for the additional visuals and wireframes. We are now confident we can make a decision on this application in line with the development plan and the LWECs. As advised we had concerns with regards to the visual impacts from those locations you have now submitted the visuals for.

The visuals have confirmed that our concerns were valid and that the turbine would introduce a large industrial scale development into the rural landscape not visually associated with any development. This approach is not consistent with the LWECs as previously advised. View 1 provides for a single large turbine in an agricultural setting, whilst view 3 raises the most concern given its large scale relative to the landscape. View 5 presents a turbine that is industrial in scale and set in an agricultural landscape with no visual association with any development. In this instance it is considered the turbine is simply too large and overly ambitious for the site.

We maintain our stance that the area can accommodate some form of wind turbine development on the lower site. This is most likely to be a turbine of more agricultural proportions as opposed to industrial. Through your investigations you might find that a grouping of turbines that avoid the stacking effect would be appropriate – but this would need to be backed up by the necessary visuals and taking account of the wider landscape and visual impacts.

I appreciate that the above will be disappointing especially given your efforts to produce the additional visual information but it is only as a result of this new information that we have been able to arrive at position where we can make a decision on the application. In terms of timescales I envisage being able to submit a report to Peter Bain in the next week or so for review.

Kind regards,

David Love

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