Craiginmoddie Wind Farm
Additional Information - Main Report

Energiekontor UK Ltd

October 2021

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Additional Information

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1 INTRODUCTION

Background

1.1 This Additional Information Report is submitted in support of a Section 36 application for consent submitted in January 2021 (ECU00002196) by Energiekontor UK Ltd ("the Applicant") to the Energy Consents Unit (ECU) for fourteen wind turbines and associated infrastructure ("the Proposed Development") on land at Craiginmoddie ("the Site"). The planning application was accompanied by an Environmental Impact Assessment Report ("the EIAR") as required under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations.

1.2 Regulation 19 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 directs that, in order to ensure the completeness and quality of the EIA report, the Scottish Ministers must (having regard in particular to current knowledge and methods of assessment) seek from the developer supplementary information about any matter mentioned in schedule 4 which in the opinion of the Scottish Ministers is directly relevant to reaching a reasoned conclusion on the significant effects of the development on the environment.

1.3 It has been agreed with the ECU that supplementary information should be provided by the Applicant on a limited number of issues. This Additional Information submission provides that response in addition to supplementary information which serves to clarify or reinforce the information provided as part of the EIAR. The ECU request for additional information, verification and clarification on the matters is included at Appendix 1.1.

1.4 This Additional Information is submitted under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations and should be advertised and made available for consultation under the terms of Regulation 26.

Request for Additional Information

1.5 In respect of Regulation 19, the Scottish Ministers have requested the following Additional Information:

- SEPA - Holding objection - SEPA request additional information regarding issues raised regarding Private Water Supplies (PWS). Our response is provided at section 3 with the PWS Report included at Appendix 3.1
- Peat Slide Risk Assessment (TA 12.3 of Vol III) the missing appendices from the submitted application. This is provided at Appendix 5.1

Structure of this Additional Information

1.6 In addition to the formal request for Additional Information, confirmation on a number of matters has previously been provided in response to issues raised by consultees through the consultation process. These additional matters are referred to in the ECU request letter

and correspondence relating to these are provided as Appendices to this submission with further discussion (where necessary) provided in the main text of this report.

1.7 This Additional Information report is structed as follows:

- Section 2 provides supplementary information on landscape and visual issues in relation to comments that have been raised by consultees;
- Section 3 provides supplementary information on PWS in relation to comments that have been raised by consultees;
- Section 4 provides supplementary information on Noise issues in relation to comments that have been raised by consultees; and
- Section 5 provides supplementary information on other matters which have been raised by consultees.

Contact for Further Information

1.8 For additional copies, a charge of £15 will be made for a full electronic copy of this Report on CD or memory stick.

1.9 Requests for copies should be made to:

Justin Reid

E: Justin.Reid@energiekontor.com

2 LANDSCAPE AND VISUAL

Introduction

2.1 This chapter addresses the issues raised by South Ayrshire Council ("SAC"), NatureScot and local residents in relation to landscape and visual (L&V) matters. The consultation and Applicant response relating to L&V matters is provided **Appendix 2.1** and summarised in this section.

2.2 Issues raised relate to:

- Nic of The Balloch viewpoint
- Updated Residential Visual Amenity Assessment
- Wirelines and ZTV relating to Merriick Wild Land Area

2.3 In addition, aviation consultant Wind Power Aviation Consultants (WPAC) has produced a night-time lighting mitigation assessment which is provided at **Appendix 2.4** and summarised in this section.

Issues Raised

2.4 The following information was requested by South Ayrshire Council (SAC):

- *Nic of The Balloch Viewpoint. The additional wireline submitted for the Nic of the Balloch has indicated a potential landscape and visual amenity impact concern. The wireline submitted is helpful in this regard, however, it would be beneficial if the wireline could be superimposed on a photograph. Whilst we are fairly confident that we have interpreted the position of the turbines in the landscape relative to the summit of Doughty Hill and its sub-tops it would be very helpful to have the wirelines of the turbines superimposed on a photograph to clarify the extent to which the lower portions of the turbine towers will be visible. It is unclear whether the lower sections of the towers will be screened by topography or whether the entire tower for some of the turbines will be visible. This will have an influence on our ultimate assessment of landscape and visual effect.*

- *A wireline taken from the northern corner of the courtyard at Dobbingtsone Farm. We require this to determine whether any of the turbines will be visible from within the court yard area formed by outbuildings located on the western side of this house.*

- *A wireline taken from the seating area outside the extension to Knockrochar Farm (which comprises a living room) looking towards the wind farm site. This extension is not shown on the OS mapping.*

2.5 These issues are discussed in turn below.

Nic of The Balloch

2.6 The additional wireframe overlay visualisation requested by SAC is provided in **Appendix 2.1**.

2.7 Further comments about the nature of concerns relating to this viewpoint was provided by SAC in an email dated 07 October 2021:

"a number of the turbines will be prominent when viewed from the Nic of The Balloch, which is a well known and popular scenic road/viewpoint. We are concerned that the impact on views will be significant in EIA terms."

2.8 In response we would note that this location is not a promoted viewpoint, nor is it marked on OS mapping as a viewpoint, and it does not form part of a route specifically promoted for its scenic quality. However, it does form part of National Cycle Network (NCN) Route 7 and is located within the High Carrick Hills Local Landscape Area (LLA).

2.9 Paragraph 6.176 of the EIAR considers effects on NCN Route 7 users passing Nic of The Balloch. It concludes that the Proposed Development would result in a Large/Medium scale visual change at this location and the supplementary visualisation requested by SAC confirms this. Overall effects on users of the route were assessed to be Moderate and Not Significant. In respect of the LLA, the EIAR did not identify any significant effects on landscape or visual receptors within the designated area and it concluded that the Proposed Development *'would not fundamentally undermine any of the reasons for designation'*.

2.10 The additional visualisation from Nic of The Balloch requested by SAC illustrates and confirms assessments of the scale of landscape and visual change made for this location within the EIAR and does not alter any of the findings of the landscape and visual impact assessment (LVIA).

Residential Amenity

2.11 A Residential Visual Amenity Assessment (RVAA) was included with the planning application within EIAR Vol III Technical Appendices 6.7. An initial assessment was undertaken for all properties within 2km with two additional properties outside this distance also assessed.

2.12 At the time of the assessment restrictions in place in relation to Coronavirus meant that individual visits to properties were not undertaken and the RVAA was informed by a combination of site visits to public locations around properties and desk based assessment. This utilised a range of information sources including aerial photography, wireline visualisations and 3d modelling. Information presented in the Residential Visual Amenity Survey (RVAS) report (Technical Appendix 5.4 – dated April 2015) of the Hadyard Hill Extension Wind Farm (HHEx) (EC00003118) was also referred to, to supplement other sources of information. Based on the specific circumstances relating to each property it is considered that the survey effort was robust.

2.13 As a result of the request by SAC and by the residents at Dobbingstone Farm a further site visit was undertaken at this property on the 3rd September 2021.

Dobbingston Farm

2.14 The additional wireline taken from the northern corner of the courtyard at Dobbingtsone Farm, requested by SAC, is presented at **Appendix 2.2**. A photowire was also taken within the courtyard and is presented at Annex 1 (confidential). This should be treated with some caution because the view is very constrained with no distant features to match the wireline against. Whilst not as accurate as a normal visualisation we consider that this represents a fair reflection of the views available of the windfarm from within the courtyard.

2.15 The visual amenity assessment at the property included within the planning submission predicts a Major level of effect i.e. the highest level of effect at the property. Neither the site visit nor additional wireline give rise to any information that would alter the effects identified within the RVAA however a number of factual points were identified:

- Bedroom windows upstairs on the north western façade, facing into the courtyard, are set in bays and have oblique views of operational turbines at Hadyard Hill.
- No views of operational turbines are possible within the yard area.
- Vegetation in the garden and beyond provides some screening of operational turbines at Hadyard Hill but there are also some open views. Numerous seating areas have been created within the gardens, many adjacent to the boundary with open views out. Some are oriented looking towards operational turbines at Hadyard Hill.
- The scale difference between operational Hadyard Hill turbines is likely to be notable. A foreshortening effect resulting from nearby topography is more readily apparent in reality than illustrated by the wireline and the sense of perspective looking along the operation Hadyard Hill array is less pronounced.
- Open views to the Site would occur from the south eastern part of the garden, including a seating area on the boundary here.
- There are only two windows on the south eastern elevation, facing the site, and these are set low down with a bank rising up to the garden at a higher level directly outside windows. Some vegetation close to windows would partly screen/filter views of the turbines. One small skylight also faces towards the Site and it was noted that this is located over the upstairs landing.
- With reference to the photowire, at the northern corner of the courtyard, forestry on Craiginmoddie hill can just be seen through a gap between buildings. It is likely that T12 would be partly visible through this gap although there is a tree here that would partly screen/filter views of turbine. It is likely that the blade of T1 would be seen above the courtyard building.

2.16 The RVAA text erroneously stated that there would be eight turbine hubs visible from the property although nine are clearly illustrated on the accompanying wireline which informed the assessment. A For the avoidance of doubt, it is confirmed that:

- The wireline illustrates nine turbine hubs would potentially be visible (T1-T5 and T11-T14).
- Based on site observations, the hubs of turbines T11 and T12 are likely to be screened by intervening forestry.

2.17 It is noted that the aviation lighting scheme developed subsequently to the EIAR (see below) could result in the potential for no requirement for visible lighting for up to five of

the turbines. However, the CAA have agreed this only provisionally and on the basis of two of the turbines not requiring visible lighting (non-perimeter turbines T4, T14) accounting for this and those noted above as likely to be screened by forestry, only five hub lights are likely to be visible from the property; a reduction on the number initially identified within the RVAA.

2.18 Taking the above points into consideration, no new information has been identified that would materially alter the findings of the original RVAA. There would be a Substantial magnitude change to views from the property which would result in a Major level of visual effects although these would not be sufficient to meet the Residential Visual Amenity threshold.

Knockrochar Farm

2.19 The additional wireline for Knockrochar Farm which is taken from the seating area outside the extension to the farm, as requested by SAC, is included within **Appendix 2.2**. This does not illustrate anything notably different from the wireline provided within the RVAA and does not change the assessment of effects set out within the RVAA.

Merrick Wild Land Area

2.20 The following information was requested by NatureScot in relation to Merrick Wild Land Area (WLA):

- *"A wireline from the area around Loch Girvan Eye in the far north east of the WLA*
- *viewpoint location between Craigmasheen and Loch Girvan Eye and also indicating relevant operational and consented developments*

We believe that this is an area of high relative wildness where it seems, under further examination of the ZTV's, that a number of turbine hubs might be visible and the existing wild land assessment produced to date does not provide suitable detail or our assessment purposes.

This issue is needed to clarify an issue with visibility in the far north east of the WLA which we believe is an important consideration in this application."

2.21 In response, the following information was provided:

- Stephenson Halliday covering letter and assessment (**Appendix 2.3**) which includes –
  - ZTV – Visible Aviation Lighting
  - Wirelines K – M and supporting text

2.22 In their covering letter Stephenson Halliday conclude:

"whilst the information presented does not identify any fundamentally new effects or areas that may be affected by the proposed development that weren't considered as part of the Wild Land assessment contained in the Wild Land Report. It gives further support to the conclusion that overall effects on the WLA would be Moderate/Minor significance and

Adverse due to the presence of man-made structures seen from elevated locations within the northwestern part of the WLA – this includes the entire finger or spur that sits to the north of Tarfessock and Shalloch on Minnoch.

There would be no material change in the experience of any of the wild land qualities and these effects would not be significant".

Night-time lighting

2.23 NatureScot object to the proposal in their formal response to the application (18 June 2021) on grounds which relate to the impact on the special qualities on part of the Merrick Wild Land Area ("WLA"). This includes the significant effects of turbine lighting. Specifically, they state:

'Current regulations mean the proposed turbines would require 2000cd night time lighting on all 14 turbines unless otherwise agreed with the relevant authorities. This would result in additional significant adverse effects of the perception of wildness attributes at dusk and into the night. There would be further and substantial weakening of the attributes and responses highlighted in WLA 01 Merrick, Qualities 3 and 4. We object to this proposal due to the significant effects of turbine lighting'

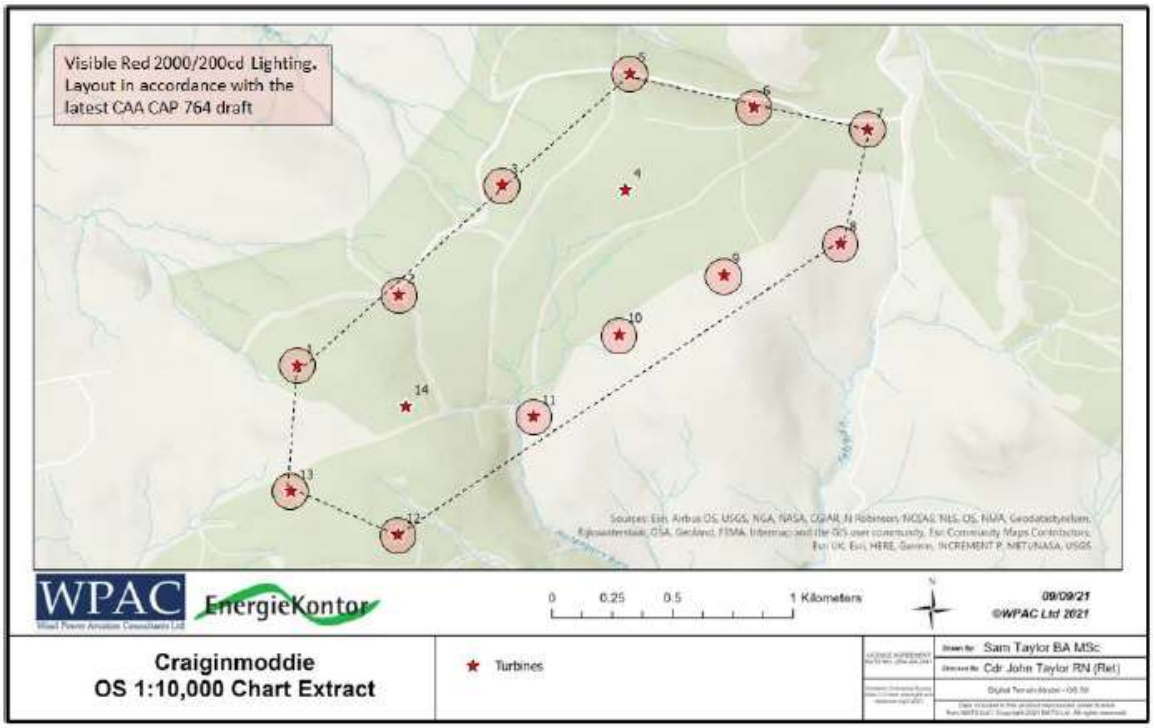
2.24 A lighting scheme has been designed for the Proposed Development by WPAC. Their report is provided at **Appendix 2.4** and this supplements the information provided as part of the EIAR, in particular those aspects which relate to turbine lighting.

Lighting Layout

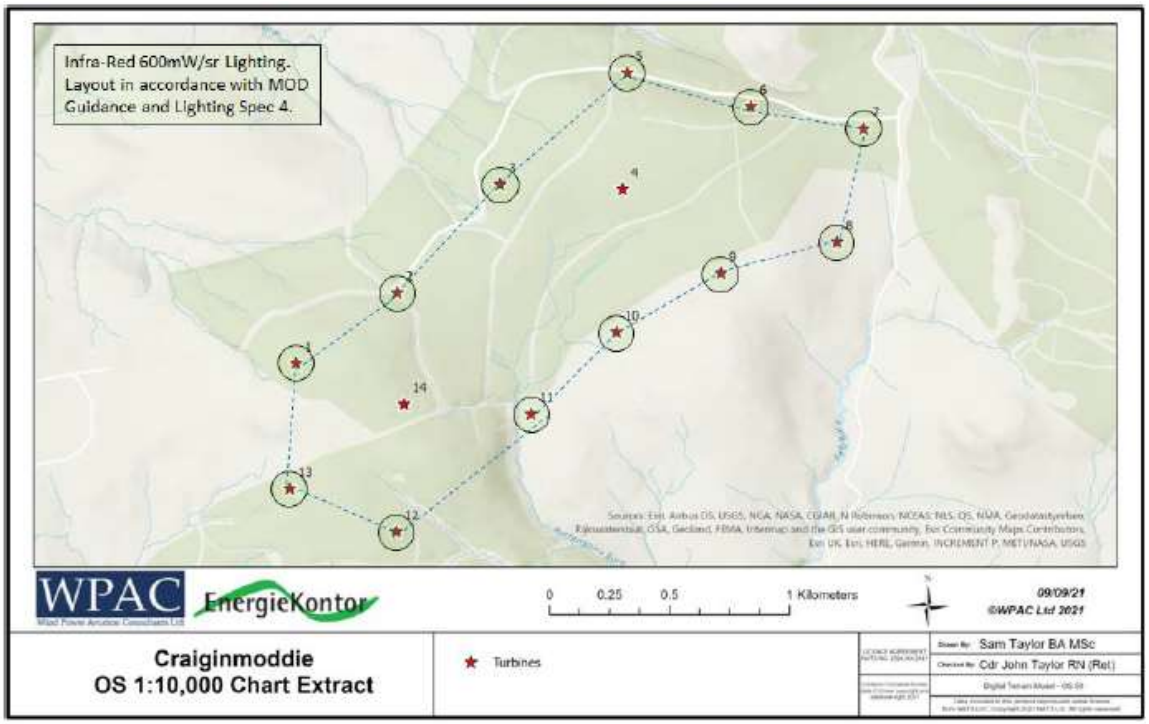
2.25 Prior to considering the mitigation measures that can be included on the turbine lights it is first appropriate to consider the layout of the turbine lighting scheme, as it is not the case that all turbines will require visible lighting to be fitted. A lighting scheme has therefore been designed for the Proposed Development by WPAC having regard to the regulations and guidance contained within CAP764. WPAC has designed a number of Civil Aviation Authority (CAA) and MOD compliant lighting layouts for wind farms and has also been in constant dialogue with the CAA regarding the proposed change to CAP 764 in terms of aviation requirements.

2.26 The Proposed Development will require ANO (2000/200 candela) visible red lighting from dusk to dawn. The number of turbines carrying the ANO (Air Navigation Order) lighting will be defined by the recent release of the draft CAP 764. The Proposed Development occupies a relatively small site and only the '900m perimeter spacing' and '200m perimeter' displacement rules of CAP 764 will be applicable to the lighting layout. These rules require all perimeter turbines to be lit with ANO lighting unless removing a light from a turbine leaves a lighting gap of 900m or less, in which case the light can be removed. Equally, any centrally located turbine within 200m of the perimeter must be lit unless the bordering turbines are less than 900m apart.

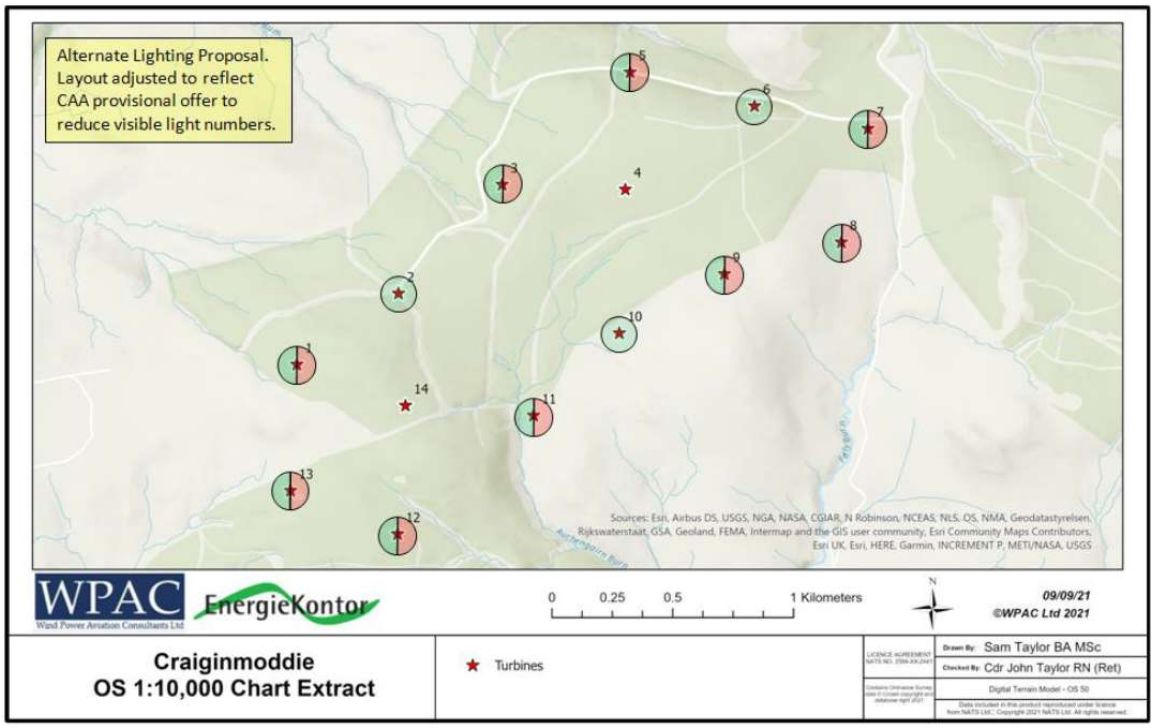
2.27 Applying these criteria dictates that all of the twelve perimeter turbines of the Craiginmoddie site would require ANO visible red lighting. This is shown on Figure 2 (CAA-ANO CAP 764 Compliant Lighting Arrangement) of the Report reproduced below.



2.28 In addition, the Ministry of Defence (MOD) will require the turbines to be lit with infrared lights (IR) that can be seen by military pilots operating on night vision googles. The resulting lighting scheme proposed for Craiginmoddie Wind Farm in relation to IR is shown on Figure 4 (MOD IR Guidance Compliant Lighting Arrangement) of the Report as reproduced below. The MOD have confirmed that the aviation lighting scheme meets the laid down requirement of the MOD and therefore have no concerns (see **Appendix 2.4.1**).



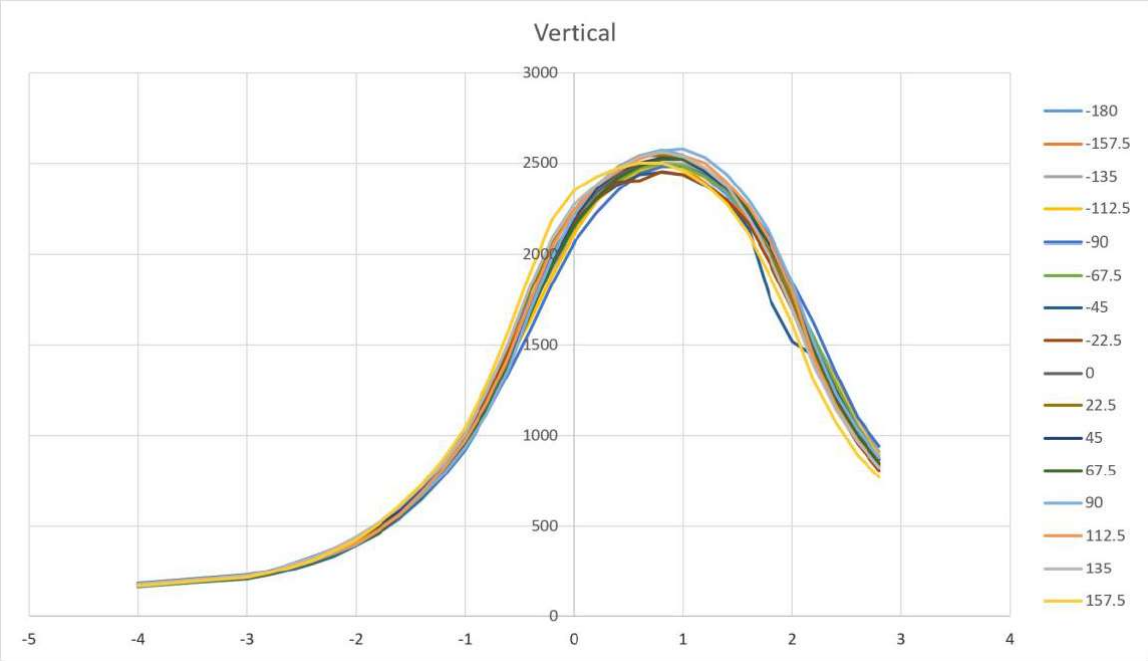
2.29 Detailed discussions have taken place with the CAA and this has indicated that the ANO lights on Turbines T2, T6 and (T10 or T9) can be removed provided that resultant light spacing is kept no greater than as currently proposed. This is shown in Figure 8 of the Report, reproduced below



Proposed mitigation measures

2.30 Potential mitigation measures are set out paragraphs 13 – 16 of the WPAC Report.

2.31 The standard aviation lights to be fitted to the nacelle of the turbines are required to fulfil certain design criteria in terms of brilliance and coverage. They are designated 'medium intensity obstruction lights' and have a minimum luminous intensity of 2000 candela at the horizontal plane and above. The LED lights are also required to be able to shine a beam that reduces in intensity below the horizontal. The manufacturer of such obstructions lights, CEL, has tested its light (the CEL ML-2KR) in a calibration chamber and produced results showing precisely how much the beam diminishes in brilliance at any specified elevation angle. Figure 12 of the WPAC Report (below) demonstrates the reduction in luminous intensity below the horizontal and also above 1° in elevation. The various coloured lines are the candela measured from different angles in the horizontal in order to measure the performance all around the light.



2.32 This data can be used to calculate the luminous intensity (candela) of the visible lights from various viewpoints based on the precise angle of elevation between the turbine lights and the viewpoint. Candela is the SI Unit of luminous intensity and refers to the amount of light emitted in a particular direction. However, when considering the perception of light from a viewpoint, the distance between the light and the viewpoint is the dominant factor and the resultant mico-lumens is the most relevant figure.

2.33 Calculations have been undertaken for each designated lit turbine against all Craiginmoddie viewpoint locations utilising the reduced turbine lighting layout shown in Figure 8 of the WPAC Report (and above). The candela figures radiated toward a viewpoint, taking into account the distance and a calculation of the lumens per square meter that would be experienced by the human eye at the viewpoints are set out at paragraph 16 of the WPAC report for each viewpoint. These figures are for perfect clear-air figures and therefore the worst case scenario from LVIA perspective. In practise the light intensity at the viewpoints will be further attenuated by scatter and absorption by airborne dust, droplets and aerosols in the atmosphere.

2.34 The results show that there is a significant decrease in the luminous intensity of the light emanating towards those viewpoints which are lower angles of elevation in relation to the turbine hub. The brightest lit turbine from each of the viewpoints is shown on Table 4 of the WPAC Report. These are represented by micro-lumens (i.e. how the light is perceived from a particular viewpoint) with a comparison of other lights in the environment at Table 5. Emitted candela rather than micro-lumens is provided at Table 6.

2.35 CAP 764 provides that if the horizontal meteorological visibility in all directions from every wind turbine in a group is more than 5km then the intensity of the light may be reduced to not less than 10% of the minimum peak intensity specified for a light of this type. The lights can therefore be reduced from 2000 candela to 200 candela in periods of good visibility.

2.36 It is an important exercise to assess how much of the time the lights would spend at 2000 candela and at the reduced level of 200 candela. The closest meteorological stations to the Site that provide this historical data are located at Prestwick Airport. The visibility will not be identical at the two locations but will be similar. The Report indicates that visibility is below 5km for an average of 2% of the time which suggests that the lights will be at 2000cd for 2% of the time and 200cd for 98% of the time or possibly less given the climate around Craiginmoddie compared to Prestwick (Paras. 27 – 33 of the Report).

Merrick WLA – Lighting Intensity

2.37 The representative viewpoint for the WLA is viewpoint 15 of the LVIA.

2.38 Taking into account the above inherent mitigation measures, the candela and micro-lumens are shown in the following table which is reproduced from the WPAC Report:

Turbine	Distance (km)	Elevation Angle	Candela	Candela at 10%	Microlumens	Microlumens at 10%	Obscured
1	17.838	1.1	2471	247	7.8	0.8	
3	17.84	1.1	2471	247	7.8	0.8	
5	17.878	1.2	2439	244	7.6	0.8	
7	17.11	1.2	2439	244	8.3	0.8	
8	16.792	1.3	2393	239	8.5	0.8	
9	16.978	1.2	2439	244	8.5	0.8	
11	17.026	1.4	2347	235	8.1	0.8	
12	17.041	1.2	2439	244	8.4	0.8	
13	17.478	1.2	2439	244	8	0.8	

Viewpoint 15

2.39 This table shows the distance to each turbine, the elevation angle (i.e. the angle above or below the horizontal plain) and luminosity shown in candela and in microlumens both at 2000cd and at 200 candela. Because the AOD for viewpoint 15 is 843.6m, which is above the height of the turbine hub light (horizontal plain) for each of the corresponding turbines, views from this viewpoint do not benefit from directional shielding.

2.40 The results in Table 4 of the Report show that, in terms of micro-lumens the brightest turbine at this location viewpoint is T8 and luminosity will be at 8.5 microlumens when at 2000cd (predicted to be 2% of the time) and 0.8 microlumens when at 200cd. To put this into context, for 98% of the time the lights would be perceived as less bright than a car brake light at 10km (see WPAC report table 5).

Conclusion

2.41 The WPAC report concludes that:

"CAA have provisionally agreed to remove the visible ANO lighting requirement on three turbines: T2, T6 and T9 or T10. Accordingly, the 14-turbine proposal requires 9 visible red and 12 infrared hub mounted obstruction lights. In addition the site is in an area where it will positively benefit from weather obscuration of its visible ANO lighting. This obscuration benefit is potentially quite significant (para. 35).

The report also reports the brilliance of lights that will be visible taking into account the elevation angle between the turbine obstruction light and the viewpoints and the distance between each turbine and each viewpoint. The report shows that for up to 98% of the time, the lights will only be required to operate at 10% luminous intensity which will significantly reduce obstruction light effects in the area…lights will be regularly obscured by cloud and when not obscured set at 200cd for 98% of the time". (Para. 44)

2.42 Currently, the LVIA at paragraph 6.330 (EIAR Vol 1) considers that visual receptors in areas of dispersed settlement within the upper Stinchar Valley would experience Moderate and Adverse effects as a result of lighting which would be significant. However, this assessment is based on a worst-case scenario i.e. when required, lighting will be 2000cd at all times on all 14 turbines. It is likely that the CAA will confirm that the lighting scheme is acceptable and therefore we anticipate a slight reduction in adverse effect from this viewpoint.

3 PRIVATE WATER SUPPLIES

Introduction

3.1 A Private Water Supply Risk Assessment (PWSRA) produced by Natural Power is provided at **Appendix 3.2.** This report is provided in response to the SEPA consultation letter 28th June 2021 (**Appendix 3.1**) and in reply to the specific requirements of SAC as set out in their Scoping response to the project in relation to Private Water Supplies.

Issues Raised

3.2 SEPA confirm a holding objection and request that determination be deferred until further information is provided regarding private water supplies:

"Existing Groundwater Abstractions including Private Water Supplies

- *The 'non construction zone' buffer areas around PWS sources and infrastructure as set out in Section 12.181 of the EIAR is not stated*
- *The water supply source of the supplies of Dalwayne Cottage, Corphin Cottage, Delamford Farm and Dobbingston Farm needs to be confirmed in order to confirm if any are within prescribed buffer zones i.e 100m from the proposed access track or 250m from turbine foundations and borrow pits. The details should include, but not limited to, the coordinates of the PWS sources, the type (e.g borehole, well, spring, surface water etc).*
- *Risk assessments should be provided for any sources found to be within the buffer zones. It is also recommended any contingency plans to maintain supplies are agreed with landowners before construction starts. This is particularly relevant for the Lindsayston Farm supply as the proposed access track is likely to cross the PWS infrastructure. "*

3.3 In its Scoping Response to the project SAC state:

"The applicant shall submit to the planning authority a site-specific hydrogeological report (not desk top study), which contains a review of the risks to all private water sources, their catchment areas, and the supplies, that have the potential to be affected by the development. Work shall not commence on site prior to the written approval of the Planning Authority being obtained.

The report should include a field assessment of all private water sources and supplies and their catchment areas, and focus on the effects of the development on the quality and quantity of water supplied to all private water users both within and out-with the boundary of the proposed site that have the potential to be affected by the development.

A conceptual site model should be included as this is key to developing a robust assessment of all risks to all potentially affected private water supplies. Attention should also be given to possible leachate generation at any Borrow Pit excavations."

Conceptual Site Model (CSM)

3.4 An assessment of private water supplies was included as part of the EIA Report (Chapter 12 Vol 1) and this identified seven properties which may be hydrologically connected to the Proposed Development. Two of these were further assessed to be hydrologically and hydrogeologically disconnected from the Proposed Development.

3.5 Five properties were therefore considered further within the EIA Report and the scope of works in producing the CSM is set out at Section 1.2 of the PWSRA.

3.6 For a pollutant linkage to exist, sources, pathways and receptors must align in a manner that facilitates the transmission of a pollutant (or harm) to a receptor. The main impacts that can be imparted upon a private water supply receptor is a degradation in water quality (pollution etc) or for the PWS water source to be disrupted in a manner that supply quantity is reduced.

3.7 Two means of water supply to springs (springs are the source for each of the properties assessed) are considered to potentially contribute to the flow, either individually or a combination of both. These are shallow groundwater / surface water or emergence of groundwater as it flows along geological structures. Observations in the study areas in relation to shallow groundwater / overland flow and groundwater flow along structural features are provided at Section 4.4 of the PWSRA.

3.8 The potential main hazards associated with activities and operations for the Proposed Development are set out in Section 4.2 of the PWSRA and a description of each of the private water supplies for each of the properties including a description of the catchment and additional observations is provided at Section 3 of the PWSRA.

3.9 The properties are:

- Dobbingston Farm
- Lindsayston Farm
- Delamford Cottage and Farm
- Corphin Cottage
- Doughty Cottage

3.10 The receptors under consideration in the case of each of the PWS is the source of water which feed the abstraction. In the case of all the PWS, following field inspection it is assumed that each PWS abstraction is fed by a spring. As well as the source of water, the infrastructure that delivers water from the PWS abstraction to the PWS property is also considered as a receptor.

3.11 A summary of the Conceptual Model is provided at Section 4.5 of the PWSRA.

Mitigation

3.12 The implementation of specific and good practice measures is presented and committed to within the EIAR at Chapter 12. These are also provided at Section 5 of the PWSRA.

3.13 Section 5.1 of the PWSRA outlines the Good Practice Mitigation that would be incorporated into a site-specific Construction and Environmental Management Plan (CEMP) and includes provisions for pollution prevention and drainage. It is also recommended that the CEMP contain a Private Water Supply Monitoring Plan and Method Statement that would detail all of the relevant Good Practice Mitigation as well as any additional mitigation identified in Appendix 3.1 of the PWSRA.

3.14 In addition to Good Practice Mitigation, additional specific mitigation has been outlined for a number of the PWS. The additional mitigation is related to construction methods when working within the vicinity of PWS infrastructure (i.e. Delamford and Linsdayston) as well as mitigation to protect groundwater including limiting the movements and handling of fuels, chemicals and oils and also more closely controlling dewatering and discharge activities. It is also recommended that further investigation be undertaken at Dobbingstone Farm and Doughty Farm to more precisely understand the potential for a groundwater pathway between the Proposed Infrastructure and the PWS abstractions. No micrositing of infrastructure closer to the Dobbingstone abstraction is also recommended. The findings of the further investigation should be used to reassess the risks to the supply and also to enable the design of appropriate mitigation. The risk assessment as presented, assumes the completion of further assessment prior to construction.

Risk Assessment

3.15 A risk assessment is provided at Section 6 of the PWSRA. This considers the type of hazard associated with the Proposed Development, the probability and magnitude of an impact occurring, based on the results of the investigation and the severity of such an impact based on the combination of the probability and magnitude values. In addition to contamination, there is also the possibility that supply continuity could be jeopardised through water quantity reduction.

3.16 Where there is an identified risk or uncertainty meaning the presence of a potentially unacceptable risk, protection or mitigation should be provided that must ensure the PWS:

- Is adequately preserved in terms of both water flow and water quality; and/or
- Is replaced by an alternative process whereby potable water is made available on a temporary or permanent basis, as appropriate

3.17 The approach and methodology for quantifying risk and the risk profile and residual significance in terms of effects following mitigation is provided at Sections 6.1 and 6.2 of the PWSRA.

3.18 Following mitigation, for Dobbingston Farm, Lindsayston Farm and Delamford Cottage and Doughty Farm the effects are predicted to be Medium/Low (not significant).

Conclusion and recommendation

3.19 There is some uncertainty in the risk assessment in relation to Dobbingston Farm and Doughty Farm with the potential influence of structural features within the bedrock which could form a pathway and subsequently impact upon the supply of water to the abstraction or cause a reduction in quality as a result of the Proposed Development.

3.20 It is recommended that further investigation is undertaken pre-construction to establish this potential more accurately and to identify the requirement for any further mitigation. More detailed recommendations for this additional investigation are discussed within the Private Water Supply Risk Assessment provided in Appendix 3.1.

4 NOISE

Introduction

4.1 A number of responses have been received in relation to Noise.

4.2 A small number (4) of 'Error….Reference' messages were included in Chapter 10 of the EIAR. For completeness, Chapter 10 (without error messages) is provided at **Appendix 4.1**. Some limited changes to Chapter 10 are now superseded by the information provided below.

4.3 SSE submitted a letter in response to the application (11th March 2021). This is provided at **Appendix 4.2** along with the Applicant's response.

4.4 The response from SAC's noise advisors ACCON to the application is provided at **Appendix 4.3.** Referring to the ACCON report Alan Edgar at SAC made the following observations in his email dated 14 July 2021:

> *"1/ Background Noise Survey Undertaken on 12 November 2020*
>
> *Our consultant notes that the evidence submitted in the EIA does not include a table of results presenting the data from the attended noise survey and observations of the weather and wind speed conditions. Without this information, our consultant is unable to confirm the efficacy of the validation exercise (paragraph 6 of ACCON report)*
>
> *2/ Wind Shear*
>
> *Our consultant raises a number of technical queries over the use of the 2015 noise survey results that were collected for the Hadyard Hill wind farm extension proposal and suggests that the operational noise limits for the proposed development should be reviewed and recalculated if necessary (paragraphs 7, 8 and 9 of ACCON report)*
>
> *3/ Cumulative Effects*
>
> *Our consultant notes the lack of detailed explanation of the criteria adopted for determining which wind farms have been considered for the cumulative noise assessment (paragraph 11 of ACCON report).*
>
> *The concluding remarks provided by ACCON recommend that the noise assessment is resubmitted when background noise levels correlated to standardised wind speeds at 10m based on wind speeds at the proposed hub height have been obtained and the assessment revised accordingly."*

4.5 We respond to each in turn below:

1) *Background Noise Survey Undertaken on 12 November 2020*

4.6 The Operational Noise Assessment for the Proposed Development was carried out by Wood and is provided at Chapter 10 of Vol 1 of the EIAR.

4.7 From Wood's reading of the ACCON report they also consider important the choice of background noise measurement locations which ACCON refer to in paragraph 5 of their report:

"TNEI carried out background noise surveys at eight locations as identified in Table 10.5. The resultant background noise levels are presented in Table 10.6. However, this only provides noise data for five locations, apparently contradicting paragraph 10.36 which indicates that all of the measurement locations have been considered in the assessment for Craiginmoddie."

4.8 Table 10.5 of Chapter 10 lists 10 receptors for which the noise is to be predicted, but the last column of the table lists only five locations at which TNEI measured background noise. All five of these have been used.

Measurement	2	3	4	5	6	7	8	9	10	11	12
Subject	Knockrochar 1	Knockrochar 2	Milton Farm 1	Milton Farm 2	Dalwyne (Partial Run)	Dalwyne 1	Dalwyne 2	Doughty 1	Doughty 2	Glenginnet 1	Glenginnet 2
Average Windspeed (m/s)	2.44	2.28	2.07	1.44	4.88	4.24	3.54	5.35	4.30	2.56	2.71
L_{90} (dBA)	47.2	47.3	39.5	39.0	43.6	39.6	41.9	48.7	45.8	41.2	44.0
Main Source of Noise	Waterfall	Waterfall	Watercourse	Watercourse	Wind	Wind	Wind	Wind	Wind	Wind/Traffic	Wind/Traffic
Correlation between windspeed and L90	No	No	No	No	yes	No	yes	Yes	Yes	Yes	Yes
TNEI Background Range - Quiet Daytime $L_{A90(10min)}$ (Table 5.2) (dBA)	20.8 – 61.7		23.6 – 51.4		25.7 – 57.1			24.3 – 51.3		23.4 – 43.2	

4.9 The measurements made by Wood generally fell towards the upper end of TNEI's background measurements range for each location. In part, this is likely due to the nature of the survey (attended measurements) and the low number of measurements used to average Wood's results, by comparison to the volume of those gathered by TNEI.

4.10 At two of the locations local watercourses were the primary source of noise, likely due to the days of heavy rainfall proceeding the survey. In these locations the water noise dominated the noise environment.

4.11 In their response to the application, residents at Dobbingstone have raised a number of questions in relation to noise, particularly about the use of background noise data copied from the original Hadyard Hill assessment.

4.12 Wood agrees with SAC and its advisors, ACCON, that the environmental assessment for Hadyard Hill Extension, including the Further Environmental Information (FEI), appears to have been carried out correctly in accordance with all current guidance.

4.13 Specifically, Wood believes that the TNEI measurements accurately represent the situation at the Site. The original background noise measurements were supplemented by others made at Dobbingstone in connection with the Hadyard Hill Extension FEI.

4.14 The Hadyard Hill Extension FEI assumed a daytime lower bound to the noise limit of 40 dB. Lowering that to 38 dB in accordance with ACCON's recommendation, the background noise, and hence limits, at that receptor become as shown in Table 4-1 below.

Table 4-1: Sound Pressure Levels and any Excesses over Limits Daytime

Dobbingstone levels (dB(A))	**Wind speed (m/s at 10 metres)**								
	4	5	6	7	8	9	10	11	12
	Daytime Sound Pressure Level (dB(A))								
Background noise	≤ 35.0	≤ 35.0	35.4	36.6	37.8	39.1	40.4	41.8	41.8
Noise limit	38.0	38.0	40.4	41.6	42.8	44.1	45.4	46.8	46.8
	Night-time Sound Pressure Level (dB(A))								
Background noise	≤ 38.0	≤ 38.0	≤ 38.0	≤ 38.0	≤ 38.0	40.0	41.9	43.9	46.0
Noise limit	43.0	43.0	43.0	43.0	43.0	45.0	46.9	48.9	51.0

2) Wind Shear

4.15 Background noise data from Hadyard Hill Extension have been recycled for the Proposed Development. ACCON suggest that wind shear has not been properly modelled to account for the change in hub height.

4.16 When measuring background noise on site, if wind speed is not measured at hub height, it is scaled to hub height using exponential wind shear measured on site, then referenced to 10 m assuming logarithmic wind shear with a notional surface roughness of 0.05 m. For Hadyard Hill Extension (HHE), the wind speed was measured at 80 m and not corrected for wind shear so no details of local wind shear are supplied.

4.17 For 80 m hub height, the correction to 10 m reduces the wind speed by a factor of 0.72; for Craiginmoddie's 122.5 m, that becomes 0.68, a reduction of 5%. However, the critical aspect is not the absolute wind shear between the two hub heights but the difference between the notional logarithmic wind shear and the actual exponential wind shear on site. 0.05 m surface roughness is a reasonable value for any wind farm site, and so the error is likely to be significantly less than 5%. At its steepest, the sound power level of the WTG rises by 4.8 dB between 4 and 5 m/s (at 10 m). That suggests an error in sound power level of significantly less than ±0.25 dB.

4.18 Nevertheless, to provide a conservative prediction, 0.3 dB has now been added to the sound power level to cover this worst case.

4.19 With the new sound power levels, and the background noise data measured at Dobbingstone, the predicted sound power levels, Table 10-15 and Table 10-16 of the EIAR (Chapter 10), are superseded by Table 4-2 and Table 4-3 below, respectively.

4.20 The tables include two different scenarios for Doughty, one assuming that it is financially involved in the Proposed Development and another assuming that it is not. Each scenario has its own set of noise limits that would apply. Table 4-2 shows that for the scenario in which Doughty is not financially involved there would be a minor exceedance of 0.2 dB

at 6 m/s. It is considered that this exceedance is well within the uncertainty margins built into the noise assessment and would not be perceptible in practice.

Table 4-2: Sound Pressure Levels and any Excesses over Daytime Limits

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
1	Delamford Cottage (229045, 599160)								
Proposed Development	26.3	31.1	32.9	32.9	32.9	32.9	32.9	32.9	32.9
Noise limit	38.0	38.0	40.1	42.8	45.9	49.1	52.2	55.0	57.2
Excess	-11.7	-6.9	-7.2	-9.9	-13.0	-16.2	-19.3	-22.1	-24.3
2	Knockrochar (229733, 600740)								
Proposed Development	26.2	31.0	32.8	32.8	32.8	32.8	32.8	32.8	32.8
Noise limit	38.0	38.0	40.1	42.8	45.9	49.1	52.2	55.0	57.2
Excess	-11.8	-7.0	-7.3	-10.0	-13.1	-16.3	-19.4	-22.2	-24.4
3	Dobbingstone (230179, 600461)								
Proposed Development	27.5	32.3	34.1	34.1	34.1	34.1	34.1	34.1	34.1
Noise limit	38.0	38.0	40.4	41.6	42.8	44.1	45.4	46.8	46.8
Excess	-10.5	-5.7	-6.3	-7.5	-8.7	-10.0	-11.3	-12.7	-12.7
4A	Doughty assuming Financial Involvement (232453, 597677)								
Proposed Development	31.6	36.4	38.2	38.2	38.2	38.2	38.2	38.2	38.2
Noise limit	45.0	45.0	45.0	45.0	45.0	45.0	46.1	48.5	50.8
Excess	-13.4	-8.6	-6.8	-6.8	-6.8	-6.8	-7.9	-10.3	-12.6
4B	Doughty assuming no Financial Involvement (232453, 597677)								
Proposed Development	31.6	36.4	38.2	38.2	38.2	38.2	38.2	38.2	38.2
Noise limit	38	38	38	39.3	41.5	43.7	46.1	48.5	50.8
Excess	-6.4	-1.6	0.2	-1.1	-3.3	-5.5	-7.9	-10.3	-12.6
5	Dalquhairn House (232099, 596259)								
Proposed Development	23.1	27.9	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Noise limit	38.6	39.9	41.6	43.6	45.8	48.2	50.6	53.0	53.0
Excess	-15.5	-12.0	-11.9	-13.9	-16.1	-18.5	-20.9	-23.3	-23.3
6	Daljedburgh Farm (230801, 596312)								
Proposed Development	25.0	29.8	31.6	31.6	31.6	31.6	31.6	31.6	31.6
Noise limit	38.6	39.9	41.6	43.6	45.8	48.2	50.6	53.0	53.0
Excess	-13.6	-10.1	-10.0	-12.0	-14.2	-16.6	-19.0	-21.4	-21.4
7	Corphin Cottage (228709, 596675)								

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
Proposed Development	24.2	29.0	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Noise limit	38.0	38.0	38.0	39.3	41.5	43.7	46.1	48.5	50.8
Excess	-13.8	-9.0	-7.2	-8.5	-10.7	-12.9	-15.3	-17.7	-20.0
8	Milton Farm (229064, 596009)								
Proposed Development	21.0	25.8	27.6	27.6	27.6	27.6	27.6	27.6	27.6
Noise limit	38.0	38.0	38.5	40.3	42.2	44.3	46.3	48.3	50.2
Excess	-17.0	-12.2	-10.9	-12.7	-14.6	-16.7	-18.7	-20.7	-22.6
9	Alton Albany Lodge (227746, 594448)								
Proposed Development	16.8	21.6	23.4	23.4	23.4	23.4	23.4	23.4	23.4
Noise limit	38.0	38.0	38.0	39.6	41.9	44.2	44.2	44.2	44.2
Excess	-21.2	-16.4	-14.6	-16.2	-18.5	-20.8	-20.8	-20.8	-20.8
10	Lanes Farm (226165, 595977)								
Proposed Development	12.5	17.3	19.1	19.1	19.1	19.1	19.1	19.1	19.1
Noise limit	38.0	38.0	38.0	39.3	41.5	43.7	46.1	48.5	50.8
Excess	-25.5	-20.7	-18.9	-20.2	-22.4	-24.6	-27.0	-29.4	-31.7

Table 4-3: Sound Pressure Levels and any Excesses over Night-time Limits

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
1	Delamford Cottage (229045, 599160)								
Proposed Development	26.3	31.1	32.9	32.9	32.9	32.9	32.9	32.9	32.9
Noise limit	43.0	43.0	43.0	43.0	44.7	47.8	51.1	54.2	57.2
Excess	-16.7	-11.9	-10.1	-10.1	-11.8	-14.9	-18.2	-21.3	-24.3
2	Knockrochar (229733, 600740)								
Proposed Development	26.2	31.0	32.8	32.8	32.8	32.8	32.8	32.8	32.8
Noise limit	43.0	43.0	43.0	43.0	44.7	47.8	51.1	54.2	57.2
Excess	-16.8	-12.0	-10.2	-10.2	-11.9	-15.0	-18.3	-21.4	-24.4
3	Dobbingstone (230179, 600461)								
Proposed Development	27.5	32.3	34.1	34.1	34.1	34.1	34.1	34.1	34.1
Noise limit	43.0	43.0	43.0	43.0	43.0	45.0	46.9	48.9	51.0
Excess	-15.5	-10.7	-8.9	-8.9	-8.9	-10.9	-12.8	-14.8	-16.9
4A	Doughty assuming Financial Involvement (232453, 597677)								

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
Proposed Development	31.6	36.4	38.2	38.2	38.2	38.2	38.2	38.2	38.2
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-11.4	-6.6	-4.8	-4.8	-4.8	-5.5	-8.1	-10.7	-13.1
4B	Doughty assuming no Financial Involvement (232453, 597677)								
Proposed Development	31.6	36.4	38.2	38.2	38.2	38.2	38.2	38.2	38.2
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-11.4	-6.6	-4.8	-4.8	-4.8	-5.5	-8.1	-10.7	-13.1
5	Dalquhairn House (232099, 596259)								
Proposed Development	23.1	27.9	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Noise limit	43.0	43.0	43.0	43.0	45.0	47.3	49.6	52.0	54.3
Excess	-19.9	-15.1	-13.3	-13.3	-15.3	-17.6	-19.9	-22.3	-24.6
6	Daljedburgh Farm (230801, 596312)								
Proposed Development	25.0	29.8	31.6	31.6	31.6	31.6	31.6	31.6	31.6
Noise limit	43.0	43.0	43.0	43.0	45.0	47.3	49.6	52.0	54.3
Excess	-18.0	-13.2	-11.4	-11.4	-13.4	-15.7	-18.0	-20.4	-22.7
7	Corphin Cottage (228709, 596675)								
Proposed Development	24.2	29.0	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-18.8	-14.0	-12.2	-12.2	-12.2	-12.9	-15.5	-18.1	-20.5
8	Milton Farm (229064, 596009)								
Proposed Development	21.0	25.8	27.6	27.6	27.6	27.6	27.6	27.6	27.6
Noise limit	43.0	43.0	43.0	43.0	43.0	43.4	45.4	47.4	49.5
Excess	-22.0	-17.2	-15.4	-15.4	-15.4	-15.8	-17.8	-19.8	-21.9
9	Alton Albany Lodge (227746, 594448)								
Proposed Development	16.8	21.6	23.4	23.4	23.4	23.4	23.4	23.4	23.4
Noise limit	43.0	43.0	43.0	43.0	43.0	43.6	49.9	49.9	49.9
Excess	-26.2	-21.4	-19.6	-19.6	-19.6	-20.2	-26.5	-26.5	-26.5
10	Lanes Farm (226165, 595977)								
Proposed Development	12.5	17.3	19.1	19.1	19.1	19.1	19.1	19.1	19.1
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-30.5	-25.7	-23.9	-23.9	-23.9	-24.6	-27.2	-29.8	-32.2

3) Choice of Cumulative sites

4.21 Only the two nearest cumulative sites have been included: Hadyard Hill at 585 m from the nearest WTG to the nearest receptor and Carrick at 1606 m. The next nearest is Tralorg at 4098 m. Initial modelling of that site showed that it was more than 10 dB below Craiginmoddie at all but the two westernmost receptors, where it was at least 17.6 dB below the daytime limit. The next nearest is Assel valley, which is more than 10 dB below Craiginmoddie or at least 14.8 dB below the daytime limit. There is no reason to expect other more distant wind farms to be more significant.

4.22 The cumulative noise levels are shown in Table 4-4 and Table 4-5, which replace Table 10-17 and Table 10-18 of the EIAR (Chapter 10), respectively. At receptor Delamford Cottage, the daytime limit is exceeded by 0.2 dB at 5 m/s. In addition, at Doughty under the scenario where the property is not financially involved the daytime limit is exceeded by 1.1 dB at 6 m/s. These are both extreme worst case scenarios, assuming every turbine is noisier than the manufacturer's average, worst-case wind shear and the receptor is directly downwind of every turbine. In the unlikely event that the noise limit is found to be exceeded in practice, a minimal level of curtailment may be required.

Table 4-4: Cumulative Sound Pressure Levels and any Excesses over Limits, 122.5 m Hub Height, Daytime

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
1	Delamford Cottage (229045, 599160)								
Cumulative Noise	37.5	38.2	38.6	39.6	41.3	43.3	45.5	47.8	50.0
Noise limit	38.0	38.0	40.1	42.8	45.9	49.1	52.2	55.0	57.2
Excess	-0.5	0.2	-1.5	-3.2	-4.6	-5.8	-6.7	-7.2	-7.2
2	Knockrochar (229733, 600740)								
Cumulative Noise	31.0	33.4	34.6	35.0	35.9	37.0	38.6	40.5	42.4
Noise limit	38.0	38.0	40.1	42.8	45.9	49.1	52.2	55.0	57.2
Excess	-7.0	-4.6	-5.5	-7.8	-10.0	-12.1	-13.6	-14.5	-14.8
3	Dobbingstone (230179, 600461)								
Cumulative Noise	31.4	34.1	35.4	35.8	36.5	37.5	38.9	40.6	42.5
Noise limit	38.0	38.0	40.4	41.6	42.8	44.1	45.4	46.8	46.8
Excess	-6.6	-3.9	-5.0	-5.8	-6.3	-6.6	-6.5	-6.2	-4.3
4A	Doughty assuming Financial Involvement (232453, 597677)								
Cumulative Noise	32.8	37.4	39.1	39.2	39.3	39.4	39.6	40.0	40.6
Noise limit	45.0	45.0	45.0	45.0	45.0	45.0	46.1	48.5	50.8
Excess	-12.2	-7.6	-5.9	-5.8	-5.7	-5.6	-6.5	-8.5	-10.2
4B	Doughty assuming no Financial Involvement (232453, 597677)								

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
Cumulative Noise	32.8	37.4	39.1	39.2	39.3	39.4	39.6	40.0	40.6
Noise limit	38	38	38	39.3	41.5	43.7	46.1	48.5	50.8
Excess	-5.2	-0.6	1.1	-0.2	-2.2	-4.3	-6.5	-8.5	-10.2
5	Dalquhairn House (232099, 596259)								
Cumulative Noise	26.7	30.2	31.8	31.9	32.3	33.0	34.0	35.3	36.8
Noise limit	38.6	39.9	41.6	43.6	45.8	48.2	50.6	53.0	53.0
Excess	-11.9	-9.7	-9.8	-11.7	-13.5	-15.2	-16.6	-17.7	-16.2
6	Daljedburgh Farm (230801, 596312)								
Cumulative Noise	28.5	31.5	32.9	33.2	33.8	34.7	36.0	37.5	39.3
Noise limit	38.6	39.9	41.6	43.6	45.8	48.2	50.6	53.0	53.0
Excess	-10.1	-8.4	-8.7	-10.4	-12.0	-13.5	-14.6	-15.5	-13.7
7	Corphin Cottage (228709, 596675)								
Cumulative Noise	32.8	33.9	34.6	35.4	36.8	38.6	40.7	42.9	45.0
Noise limit	38.0	38.0	38.0	39.3	41.5	43.7	46.1	48.5	50.8
Excess	-5.2	-4.1	-3.4	-3.9	-4.7	-5.1	-5.4	-5.6	-5.8
8	Milton Farm (229064, 596009)								
Cumulative Noise	29.3	30.5	31.3	32.0	33.4	35.1	37.2	39.3	41.5
Noise limit	38.0	38.0	38.5	40.3	42.2	44.3	46.3	48.3	50.2
Excess	-8.7	-7.5	-7.2	-8.3	-8.8	-9.2	-9.1	-9.0	-8.7
9	Alton Albany Lodge (227746, 594448)								
Cumulative Noise	28.0	28.8	29.3	30.2	31.9	33.8	36.0	38.3	40.5
Noise limit	38.0	38.0	38.0	39.6	41.9	44.2	44.2	44.2	44.2
Excess	-10.0	-9.2	-8.7	-9.4	-10.0	-10.4	-8.2	-5.9	-3.7
10	Lanes Farm (226165, 595977)								
Cumulative Noise	38.0	38.0	38.0	39.3	41.4	43.7	46.1	48.5	50.8
Noise limit	38.0	38.0	38.0	39.3	41.5	43.7	46.1	48.5	50.8
Excess	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Table 4-5: Cumulative Sound Pressure Levels and any Excesses over Limits, 122.5 m Hub Height, Night-time

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
1	Delamford Cottage (229045, 599160)								
Cumulative Noise	42.3	42.5	42.7	42.7	42.6	43.3	45.7	48.2	50.5
Noise limit	43.0	43.0	43.0	43.0	44.7	47.8	51.1	54.2	57.2
Excess	-0.7	-0.5	-0.3	-0.3	-2.1	-4.5	-5.4	-6.0	-6.7
2	Knockrochar (229733, 600740)								
Cumulative Noise	34.8	35.9	36.6	36.6	36.6	37.0	38.8	40.8	42.9
Noise limit	43.0	43.0	43.0	43.0	44.7	47.8	51.1	54.2	57.2
Excess	-8.2	-7.1	-6.4	-6.4	-8.1	-10.8	-12.3	-13.4	-14.3
3	Dobbingstone (230179, 600461)								
Cumulative Noise	34.9	36.3	37.1	37.1	37.1	37.5	39.0	40.9	42.9
Noise limit	43.0	43.0	43.0	43.0	43.0	45.0	46.9	48.9	51.0
Excess	-8.1	-6.7	-5.9	-5.9	-5.9	-7.5	-7.9	-8.0	-8.1
4A	Doughty assuming Financial Involvement (232453, 597677)								
Cumulative Noise	33.6	37.7	39.3	39.3	39.3	39.4	39.6	40.1	40.7
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-9.4	-5.3	-3.7	-3.7	-3.7	-4.3	-6.7	-8.8	-10.6
4B	Doughty assuming no Financial Involvement (232453, 597677)								
Cumulative Noise	33.6	37.7	39.3	39.3	39.3	39.4	39.6	40.1	40.7
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-9.4	-5.3	-3.7	-3.7	-3.7	-4.3	-6.7	-8.8	-10.6
5	Dalquhairn House (232099, 596259)								
Cumulative Noise	29.4	31.6	32.8	32.8	32.8	33.0	34.1	35.5	37.2
Noise limit	43.0	43.0	43.0	43.0	45.0	47.3	49.6	52.0	54.3
Excess	-13.6	-11.4	-10.2	-10.2	-12.2	-14.3	-15.5	-16.5	-17.1
6	Daljedburgh Farm (230801, 596312)								
Cumulative Noise	31.8	33.4	34.4	34.4	34.4	34.7	36.1	37.8	39.7
Noise limit	43.0	43.0	43.0	43.0	45.0	47.3	49.6	52.0	54.3
Excess	-11.2	-9.6	-8.6	-8.6	-10.6	-12.6	-13.5	-14.2	-14.6
7	Corphin Cottage (228709, 596675)								
Cumulative Noise	37.3	37.7	38.0	38.0	38.0	38.6	40.8	43.2	45.5

Receptor	Wind speed (m/s at 10 metres)								
	4	5	6	7	8	9	10	11	12
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	-5.7	-5.3	-5.0	-5.0	-5.0	-5.1	-5.5	-5.7	-5.8
8	Milton Farm (229064, 596009)								
Cumulative Noise	33.8	34.2	34.6	34.6	34.5	35.1	37.3	39.7	42.0
Noise limit	43.0	43.0	43.0	43.0	43.0	43.4	45.4	47.4	49.5
Excess	-9.2	-8.8	-8.4	-8.4	-8.5	-8.3	-8.1	-7.7	-7.5
9	Alton Albany Lodge (227746, 594448)								
Cumulative Noise	32.8	33.0	33.2	33.2	33.2	33.8	36.2	38.7	41.0
Noise limit	43.0	43.0	43.0	43.0	43.0	43.6	49.9	49.9	49.9
Excess	-10.2	-10.0	-9.8	-9.8	-9.8	-9.8	-13.7	-11.2	-8.9
10	Lanes Farm (226165, 595977)								
Cumulative Noise	43.0	43.0	43.0	43.0	42.9	43.7	46.3	48.9	51.3
Noise limit	43.0	43.0	43.0	43.0	43.0	43.7	46.3	48.9	51.3
Excess	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Summary

4.23 The conclusion of the Noise chapter of the EIAR remain unchanged. The likely environmental effect of the Proposed Development during construction and during daytime and night-time operation is not significant.

5 OTHER MATTERS

Introduction

5.1 The request for Additional Information is set out in **Appendix 1.1.** This includes missing appendices from the submitted application in relation to the Peat Slide Risk Assessment (TA 12.3 of Vol III). This is provided at **Appendix 5.1**

5.2 Other matters raised during consultation (not covered in the previous sections), but which do not form part of the formal request for information are provided in this section.

5.3 In summary this includes:

- Ironside Farrar Peat Landslide Hazard Risk Assessment – Stage 2 Checking Report (September 2021) **Appendix 5.2**
- Ayrshire Rivers Trust consultation response (6th May 2021) and applicant response **Appendix 5.3.** No further comments are provided within this submission.

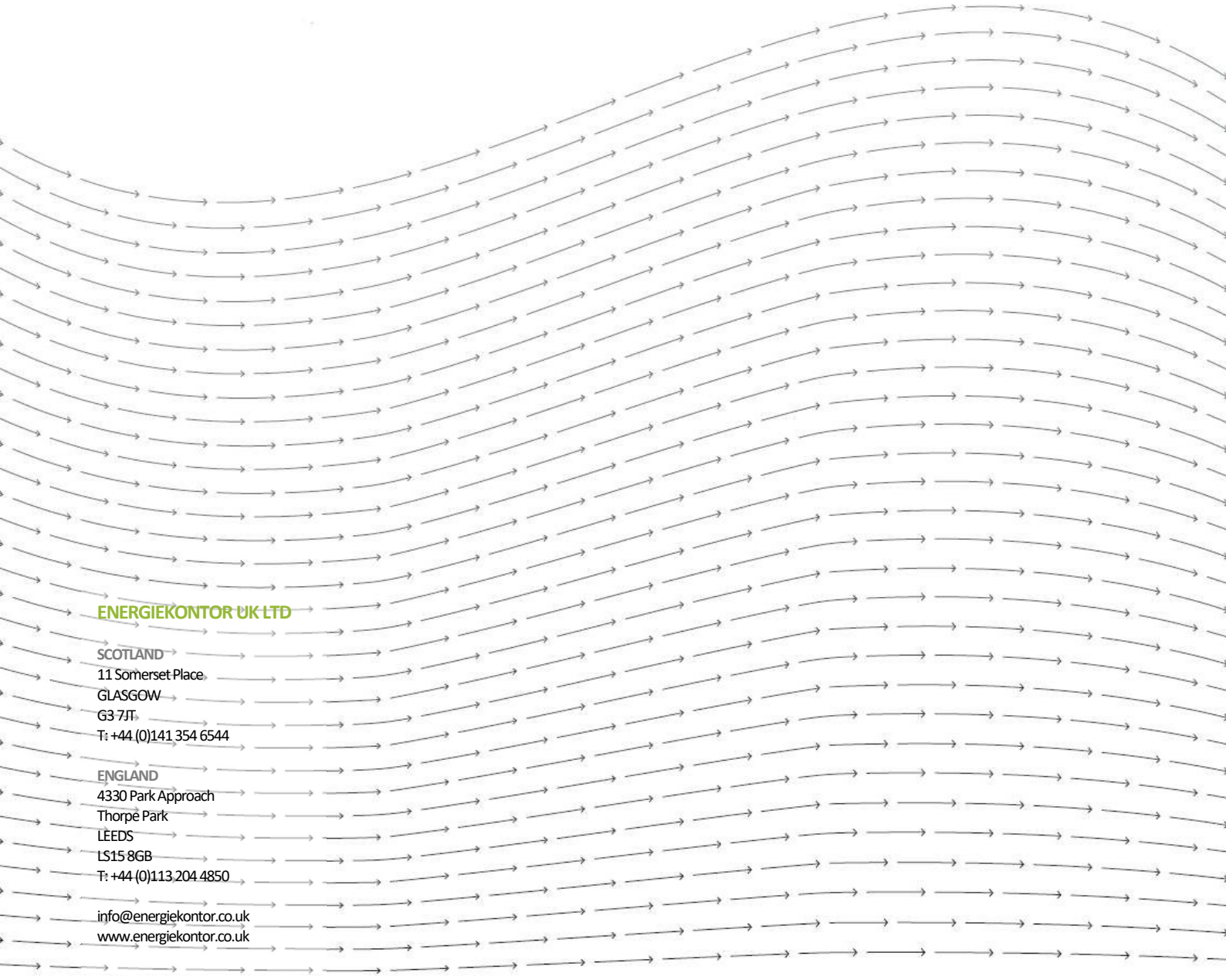
Peat Slide Risk Assessment checking report – Stage 2

5.4 Natural Power responded (May 2021) to the Ironside Farrar Peat Landslide Hazard Risk Assessment – Stage Checking Report 1 (May 2021). Ironside Farrar provided further comment and points which require further assessment or discussion. The Stage 2 Report is provided at Appendix 5.2. Specifically, at Item number 3 of the table provided, they recommend that additional peat probing is required in line with the ECU Best Practise Guide for PLHRA.

5.5 We do not agree that the assessment carried out can be improved further based on the suggested additional probing at this stage and in response, we reinforce what has already been provided and set out in Chapter 12 (and accompanying appendices) of the EIAR. The coverage of the detailed probing is in line with ECUBPG which does not require blanket detailed probing coverage across areas not identified as peatland or at risk from peat slide based on a targeting desk study exercise. Thus peat surveys at Craiginmoddie have been targeted based on the initial desk based study and across areas of greatest potential impact.

5.6 We summarise below the rationale for each of the areas highlighted by Ironside Farrar. The exception are areas subject to a post felling survey to reach the inaccessible areas. These areas can be covered by planning condition.

Infrastructure areas Identified for Additional Probing	Justification / Comments on probe coverage
T3	Dense forestry stands prevented wider probing coverage. Suggest additional investigation is included as part of planning condition post felling.
T5	Infrastructure location is not sited on peat / peatland as demonstrated via 100m probes, visual reconnaissance and this is already confirmed within the peat slide risk assessment report.
T9	Detailed probing undertaken at original location with evidence of deep peat prompting micro-siting. Microsite location is on area of level ground. Therefore he addition of peat depth information would not alter the risk category further in in this instance.
T10	Site reconnaissance, phase 1 grid probing and carbon soils mapping indicated thin peat soils or absent peat.
T11	Site reconnaissance, phase 1 grid probing and carbon soils mapping indicated thin peat soils or absent peat. Further investigations detailed in report included probes and peat cores at this location due to proximity to slope system.
Borrow Pit near T10	Detailed probing not extended across an areas which from visual reconnaissance confirmed absent peat and bedrock at or near surface.
Compound	Area is not located on peat / peatland as demonstrated by 100m probes, visual reconnaissance and confirmed within reporting.
Substation	Dense forestry precented wider proving coverage. Additional detailed probing was gathered commensurate with the practical limits on access into the forestry.
Site Entrance - T1	50% of section length is within dense forestry. Open ground section did not require probing as visual reconnaissance was for shallow or absent peat and shallow slope system.
Vicinity of T3	where 100m grid indicated <0.5m probing was curtailed as forestry is dense and terrain steep in this area limiting practical access.
T3 - T5	Track alignment requisitely follows existing track which through 100m grid probing and visual reconnaissance found not to be on peat / peatland hence detailed probing curtailed.
T5 - T6	Track alignment requisitely follows existing track which through 100m grid probing and visual reconnaissance found not to be on peat / peatland hence detailed probing curtailed.
East of T9	Detailed probing has been undertaken although data points not visible on PDF map. Confirmation that probes undertaken and incorporated into risk assessment.
T11 - T14	Generally a very challenging access track section in terms of survey access (very steep slopes and dense forestry as explained in reporting). The risk category for this section remains at the highest level as also is explained in reporting. Additional probing is not practical or beneficial to the assessment at this stage.
T12 - T13	Dense forestry / access in practical. Suggest additional investigation is included as part of planning condition post felling



ENERGIEKONTOR UK LTD

SCOTLAND
11 Somerset Place
GLASGOW
G3 7JT
T: +44 (0)141 354 6544

ENGLAND
4330 Park Approach
Thorpe Park
LEEDS
LS15 8GB
T: +44 (0)113 204 4850

info@energiekontor.co.uk
www.energiekontor.co.uk