Technical Appendix 4.4

Updated Scoping Opinion (2024)

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The Scottish Government
Energy Consents Unit

Scoping Opinion on behalf of Scottish Ministers under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

Hagshaw Energy Cluster – Western Expansion
Spirebush Ltd, subsidiary of 3R Energy Solutions Limited

17 May 2024

CONTENTS

1. Introduction

1.1 This scoping opinion is issued by the Scottish Government Energy Consents Unit on behalf of the Scottish Ministers to Spirebush Ltd a company incorporated under the Companies Acts with company number SC697238 and having its registered office at J R W, 19 Buccleuch Street, Hawick, Roxburghshire, Scotland, TD9 0HL ("the Company") in response to a request dated 14 February 2024 for an updated scoping opinion under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 in relation to the proposed Hagshaw Energy Cluster – Western Expansion ("the proposed development"). The request for a scoping opinion was accompanied by an updated scoping report which was prepared by ITPEnergised, acting as the Company's agent ("the Agent").

1.2 The proposed development is located within the western part of Dungavel Forest within South Lanarkshire and the Netherwood landholding, approximately 1.4 km to the north of Muirkirk in East Ayrshire.

1.3 The proposed development is anticipated to comprise up to 26 wind turbines with tip heights up to 230 metres, battery energy storage system ("BESS") and solar photovoltaic (PV) panels, with a total generating and storage capacity of up to 487 megawatts ("MW")

1.4 In addition there will be ancillary infrastructure including:

- Turbine foundations;
- Crane hardstandings;
- On-site access tracks between turbines and from the point of access to the turbines;
- Temporary construction compound(s), laydown area(s), and concrete batching plant(s);
- Underground cabling between the wind turbines, the electricity substation, and BESS compound;
- Borrow pits for stone;
- Meteorological mast(s).
- Photovoltaic panels and mounting frames;
- Access tracks;
- Temporary construction compound(s) and laydown area(s);
- perimeter fencing (deer stock);
- CCTV cameras;
- Inverters and transformers; and
- Underground cabling between the photovoltaic panels and the electricity substation and BESS compound

1.5 The Company indicates the proposed development would be decommissioned after 40 years and the site restored in accordance with the decommissioning and restoration plan.

1.6 The proposed development is within the planning authorities of East Ayrshire Council and South Lanarkshire Council.

A scoping report was submitted on 22 September 2022, with a scoping opinion adopted by Scottish Ministers on 14 March 2023. The scoping opinion highlighted that the proposed Development was within the boundaries of both the Muirkirk and North Lowther Uplands Special Protection Area (SPA) and the Muirkirk Uplands Site of Special Scientific Interest (SSSI). Consequently, following discussions with ECU, on behalf of Scottish Ministers, and statutory consultees, particularly NatureScot, the Company amended the site layout and submitted an updated scoping report on 08 February 2024 to reduce the impact on the SPA and SSSI.

The amended site layout of February 2024 positioned all of the wind turbines within the planning authority of South Lanarkshire Council and the solar photovoltaic panels and battery energy storage system within the planning authority of East Ayrshire Council.
Due to the varied environmental impact of each generating station in each planning authority, Scottish Ministers would encourage the Company to take careful consideration on whether it would be more pragmatic to submit two separate applications, taking into account the regulatory requirements of an EIA Report prior to submitting any application(s) for consent under section 36 of the Electricity Act 1989.

2. Consultation

2.1 Prior to the scoping opinion request a list of consultees was agreed between ITPEnergised and the Energy Consents Unit. A consultation on the scoping report was undertaken by the Scottish Ministers and this commenced on 21 February 2024. The consultation closed on 13th March 2024. Extensions to this deadline were granted to:-

- Historic Environment Scotland;
- NatureScot;
- SEPA;
- Nature Division;
- Defence Infrastructure Organisation; and
- RSPB Scotland

The Scottish Ministers also requested responses from their internal advisors Transport Scotland, Nature Division and Scottish Forestry. Standing advice from Marine Directorate - Science Evidence Data and Digital (MD-SEDD) has been provided with requirements to complete a checklist prior to the submission of the application for consent under section 36 of the Electricity Act 1989. All consultation responses received, and the standing advice from MD-SEDD, are attached in ***ANNEX A Consultation responses*** and ***ANNEX B MD-SEDD Standing Advice.***

2.2 The purpose of the consultation was to obtain scoping advice from each consultee on environmental matters within their remit. Responses from consultees and advisors, including the standing advice from MD-SEDD, should be read in full for detailed requirements and for comprehensive guidance, advice and, where appropriate, templates for preparation of the Environmental Impact Assessment (EIA) report.

2.3 Unless stated to the contrary in this scoping opinion, Scottish Ministers expect the EIA report to include all matters raised in responses from the consultees and advisors.

2.4 The following organisations were consulted but did not provide a response:

- Ayrshire Rivers Trust;
- British Horse Society;
- Civil Aviation Authority – Airspace;
- The Crown Estate;
- Galloway and Southern Ayrshire Biosphere;
- John Muir Trust;
- Mountaineering Council of Scotland;
- ScotWays;
- Scottish Wild Land Group (SWLG);
- Scottish Wildlife Trust;
- Visit Scotland;
- Muirkirk Enterprise Group;
- Muirkirk Community Association;
- Scottish Raptor Study Group (South Strathclyde);
- Sanford Upper Avondale Community Council;
- Lesmahagow Community Council;
- Coalburn Community Council;
- Douglas Community Council; and
- Strathaven and Glassford Community Council

2.5 With regard to those consultees who did not respond, it is assumed that they have no comment to make on the scoping report, however each would be consulted again in the event that an application for section 36 consent is submitted subsequent to this EIA scoping opinion.

2.6 The Scottish Ministers are satisfied that the requirements for consultation set out in Regulation 12(4) of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 have been met.

3. The Scoping Opinion

3.1 This scoping opinion has been adopted following consultation with East Ayrshire Council and South Lanarkshire Council, within whose area the proposed development would be situated, NatureScot (previously “SNH”), Scottish Environment Protection Agency (“SEPA”) and Historic Environment Scotland (“HES”), all as statutory consultation bodies, and with other bodies which Scottish Ministers consider likely to have an interest in the proposed development by reason of their specific environmental responsibilities or local and regional competencies.

3.2 Scottish Ministers adopt this scoping opinion having taken into account the information provided by the applicant in its request received by the Energy Consents Unit on 14 February 2024 in respect of the specific characteristics of the proposed development and responses received to the consultation undertaken. In providing this scoping opinion, the Scottish Ministers have had regard to current knowledge and methods of assessment; have taken into account the specific characteristics of the proposed development, the specific characteristics of that type of development and the environmental features likely to be affected.

3.3 A copy of this scoping opinion has been sent to East Ayrshire Council and South Lanarkshire Council for publication on their website. It has also been published on the Scottish Government energy consents website at www.energyconsents.scot.

3.4 Scottish Ministers expect the EIA report which will accompany the application for the proposed development to consider in full all consultation responses attached in **Annex A and Annex B**.

3.5 Scottish Ministers are satisfied with the scope of the EIA set out in the scoping report.

3.6 In addition to the consultation responses, Ministers wish to provide comments with regards to the scope of the EIA report. The Company should note and address each matter.

3.7

The proposed development set out in the scoping report refers to wind turbines, and other technologies including battery storage and solar panels. Any application submitted under the Electricity Act 1989 requires to clearly set out the generation station(s) that consent is being sought for. For each generating station details of the proposal require to include but not limited to:

- the scale of the development (dimensions of the wind turbines, solar panels, battery storage)
- infrastructure requirements for each part of the development (footprint of wind turbines, solar panels and battery storage)
-
- components required for each generating station
- minimum and maximum export capacity of megawatts and megawatt hours of electricity for battery storage

3.8 Scottish Water advised that there were no Scottish Water drinking water catchments, or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed development. Scottish Water also provided general advice which should be addressed in the EIA report, including any relevant mitigation measures required.

3.9 Scottish Ministers request that the Company investigates the presence of any private water supplies which may be impacted by the development. The EIA report should include details of any supplies identified by this investigation, and if any supplies are identified, the Company should provide an assessment of the potential impacts, risks, and any mitigation which would be provided.

3.10 Marine Directorate – Science Evidence Data and Digital (MD-SEDD) provide generic scoping guidelines for onshore wind farm and overhead line development https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Research/onshoreren) which outline how fish populations can be impacted during the construction, operation and decommissioning of a wind farm or overhead line development and informs developers as to what should be considered, in relation to freshwater and diadromous fish and fisheries, during the EIA process.

3.11 In addition to identifying the main watercourses and waterbodies within and downstream of the proposed development area, developers should identify and consider, at this early stage, any areas of Special Areas of Conservation where fish are a qualifying feature and proposed felling operations particularly in acid sensitive areas.

3.12 MD-SEDD also provide standing advice for onshore wind farm or overhead line development (which has been appended at Annex B) which outlines what information, relating to freshwater and diadromous fish and fisheries, is expected in the EIA report. Use of the checklist, provided in Annex 1 of the standing advice, should ensure that the EIA report contains the required information; the absence of such information may necessitate requesting additional information which may delay the process. **Developers are required to submit the completed checklist in advance of their application submission.**

3.13 Scottish Ministers consider that where there is a demonstrable requirement for peat landslide hazard and risk assessment (PLHRA), the assessment should be undertaken as part of the EIA process to provide Ministers with a clear understanding of whether the risks are acceptable and capable of being controlled by mitigation measures. The Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition), published at http://www.gov.scot/Publications/2017/04/8868, should be followed in the preparation of the EIA report, which should contain such an assessment and details of mitigation measures. Where a PLHRA is not required clear justification for not carrying out such a risk assessment is required.

3.14 The scoping report identified viewpoints in Table 5.1 to be assessed within the landscape and visual impact assessment. East Ayrshire Council requested an additional night time viewpoint.

3.15 The noise assessment should be carried out in line with relevant legislation and standards as detailed in section 8 of the scoping report. The noise assessment report should be formatted as per Table 6.1 of the IOA “A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

3.16 As the maximum blade tip height of turbines exceeds 150m the LVIA as detailed in section 5 of the scoping report must include a robust Night Time Assessment with agreed viewpoints to consider the effects of aviation lighting and how the chosen lighting mitigates the effects.

3.17 It is recommended by the Scottish Ministers that decisions on bird surveys – species, methodology, vantage points, viewsheds & duration - site specific & cumulative – should be made following discussion between the Company and NatureScot.

3.18 Where borrow pits are proposed as a source of on-site aggregate they should be considered as part of the EIA process and included in the EIA report detailing information regarding their location, size and nature. Ultimately, it would be necessary to provide details of the proposed depth of the excavation compared to the actual topography and water table, proposed drainage and settlement traps, turf and overburden removal and storage for reinstatement, and details of the proposed restoration profile. The impact of such facilities (including dust, blasting and impact on water) should be appraised as part of the overall impact of the working. Information should cover the requirements set out in '**PAN 50: Controlling the Environmental Effects of Surface Mineral Workings**'.

3.19 Ministers are aware that further engagement is required between parties regarding the refinement of the design of the proposed development regarding, among other things, surveys, management plans, peat, radio links, finalisation of viewpoints, cultural heritage, cumulative assessments and request that they are kept informed of relevant discussions.

3.20 The Scottish Ministers note that part of the proposed Development overlaps the Muirkirk and North Lowther Uplands Special Protection Area (SPA) and the Muirkirk Uplands Site of Special Scientific Interest (SSSI). The SPA is classified for its breeding hen harrier, peregrine, merlin, short-eared owl and golden plover, and for its nonbreeding(wintering) hen harrier. The status of the site means that the requirements of the Conservation (Natural Habitats, &c.) Regulations 1994 as amended (the "Habitats Regulations") or, for reserved matters, The Conservation of Habitats and Species Regulations 2017 apply. Consequently, Scottish Ministers will be required to consider the effect of the proposal on the SPA by completing a Habitats Regulations Appraisal (HRA). Nature Division and NatureScot have provided advice on what should be considered within the EIA report.

4. Mitigation Measures

4.1 The Scottish Ministers are required to make a reasoned conclusion on the significant effects of the proposed development on the environment as identified in the environmental impact assessment. The mitigation measures suggested for any significant environmental impacts identified should be presented as a conclusion to each chapter. Applicants are also asked to provide a consolidated schedule of all mitigation measures proposed in the environmental assessment, provided in tabular

form, where that mitigation is relied upon in relation to reported conclusions of likelihood or significance of impacts.

5. Conclusion

5.1 This scoping opinion is based on information contained in the applicant's written request for a scoping opinion and information available at the date of this scoping opinion. The adoption of this scoping opinion by the Scottish Ministers does not preclude the Scottish Ministers from requiring of the applicant information in connection with an EIA report submitted in connection with any application for section 36 consent for the proposed development.

5.2 This scoping opinion will not prevent the Scottish Ministers from seeking additional information at application stage, for example to include cumulative impacts of additional developments which enter the planning process after the date of this opinion.

5.3 Without prejudice to that generality, it is recommended that advice regarding the requirement for an additional scoping opinion be sought from Scottish Ministers in the event that no application has been submitted within 12 months of the date of this opinion.

5.4 It is acknowledged that the environmental impact assessment process is iterative and should inform the final layout and design of proposed developments. Scottish Ministers note that further engagement between relevant parties in relation to the refinement of the design of this proposed development will be required, and would request that they are kept informed of on-going discussions in relation to this.

5.5 Applicants are encouraged to engage with officials at the Scottish Government's Energy Consents Unit at the pre-application stage and before proposals reach design freeze.

5.6 When finalising the EIA report, applicants are asked to provide a summary in tabular form of where within the EIA report each of the specific matters raised in this scoping opinion has been addressed.

5.7 It should be noted that to facilitate uploading to the Energy Consents portal, the EIA report and its associated documentation should be divided into appropriately named separate files of sizes no more than 10 megabytes (MB).

Nicola Ferguson

Energy Consents Unit
17 May 2024

ANNEX A

Consultation

List of consultees who provided a response.

• East Ayrshire Council;	A1-A7
• South Lanarkshire Council;	A8-A34
• Historic Environment Scotland;	A35-A41
• NatureScot;	A42-A48
• SEPA;	A49-A60
• BT;	A61
• Defence Infrastructure Organisation;	A62-A63
• Edinburgh Airport;	A64-A65
• Fisheries Management Scotland;	A66
• Glasgow Airport;	A67
• Glasgow Prestwick Airport;	A68-A73
• Joint Radio Company;	A74-A76
• Muirkirk Community Council;	A77
• NATS Safeguarding;	A78-A88
• Nature Division:	A89
• RSPB Scotland;	A90-A94
• Scottish Forestry;	A95-A96
• Scottish Water;	A97-A98
• The Coal Authority; and	A99-A100
• Transport Scotland	A101-A107

Internal advice from areas of the Scottish Government was provided by officials from Transport Scotland, Scottish Forestry, Nature Division and Marine Directorate - Science Evidence Data and Digital (in the form of standing advice) included in **Annex B**.

See Section 2.4 above for a list of organisations that were consulted but did not provide a response. Any responses received after this Scoping Opinion is published will be added as an addendum and uploaded to the ECU Portal.

A1

General Letter

Governance

Chief Governance Officer, Solicitor to the Council and Council Monitoring Officer: David Mitchell

East Ayrshire Council
Comhairle Siorrachd Àir an Ear

Telephone: 01563 576790
Email: submittoplanning@east-ayrshire.gov.uk

Our Ref: 24/0001/S36SCP

Date: 13th March 2024

Contact: Graham Mitchell

Scottish Government Energy Consents Unit
Directorate For Energy And Climate Change
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

Dear Sir/Madam

THE ELECTRICITY ACT 1989 SECTION 36
THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017

Site Address: Hagshaw Energy Cluster - Western Expansion Phase 1

I refer to your email dated 21 February 2024 requesting this Council's comments regarding the scoping report submitted by ITP Energised Limited on behalf of Spirebush Limited.

The purpose of this response is to provide advice and guidance based on the Planning Authority's knowledge of the site and the surrounding area. This enables the Applicant to consider the issues that are identified and address these in the EIA process and EIA Report associated with the Section 36 application.

The Council has not undertaken any limited consultation with internal departments or agencies with local knowledge in respect of this scoping request. You should be aware that the onus, in this case, is on the Energy Consents Unit to undertake statutory and non-statutory consultations. A list of further consultees that would be useful to engage with as part of this process is included as Appendix 1. Please be aware that any lack of inclusion on this list of a particular party or organisation in no way indicates that the Planning Authority considers

The Opera House
8 John Finnie Street
Kilmarnock, KA1 1DD
T E L: 0 1 5 6 3 5 7 6 7 9 0
F A X: 0 1 5 6 3 5 5 4 5 9 2
www.east-ayrshire.gov.uk

that consultation would not be beneficial.

The sections below highlight the comments of the Planning Authority on a number of matters.

Non-technical summary

This should be written in simple non-technical terms and should include a summary of the main issues of each chapter of the EIA Report, including the significant effects of the development and any mitigation measures to address these potential adverse impacts. A plan sufficient to identify the application site within the wider locality and a proposed site plan should be incorporated as a minimum.

Summary of Environmental Information

A summary of the environmental information assessed throughout the EIA Report shall be provided.

List of qualifications and evidence of competency

A list detailing the qualifications and evidence of relevant expertise / competency of each individual who has been involved in the production of the EIA Report, including those involved in the assessments which have been used to inform the various chapters of the EIA Report, shall be included.

Format of the EIA Report

Two full paper copies including appendices shall be provided to the Planning Authority for internal use, although additional paper copies will also be required to be placed in appropriate locations for inspection by the public.
One electronic copy that is split into manageable sized files shall be uploaded by the Applicant to the online viewing system of the Planning Authority through the e-planning portal (contact should be made with the Council prior to upload to confirm the appropriate case file reference). These files should be clearly named thus enabling easier public/consultee interpretation, consideration and navigation. An example would be splitting the EIA Report by chapter / topic. Any confidential annex should be clearly marked and kept separate from the remainder of the EIA Report but should not contain any non-confidential information or, if it does, this should be replicated within the EIA Report.

Consideration of alternatives

Schedule 4, paragraph 2 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 requires that information on the reasonable alternatives (including design, technology, location, size and scale) considered and the main reasons for selecting the chosen option, including a

comparison of the environmental effects be included within the EIA Report. Such consideration of alternatives should therefore be included within the EIA Report.

Baseline Information

The Council has published a State of the Environment Report on its website: https://www.east-ayrshire.gov.uk/PlanningAndTheEnvironment/Development-plans/State-of-the-Environment-Report.aspx
This report collates up to date information on the environment within East Ayrshire and how it is changing. The information can be used to help inform applications. This may be of use when preparing the EIA Report.

EIA Assessment Methodology

There should be a degree of flexibility adopted within the EIA Report when reporting the significance of the impacts as moderate effects can be considered as significant in terms of the EIA Regulations and would be based on the assessor's judgement.

Planning Policy Context

The Council's East Ayrshire Local Development Plan (adopted in April 2017) remains the current LDP, alongside the East Ayrshire Minerals Local Development Plan. By the time any subsequent Section 36 application is made by the Applicant it is likely that the Council's LDP2 will be adopted, at which point the current 2017 LDP and 2020 Minerals LDP will be superseded. The Applicant is advised to keep this situation under review as they approach their intended submission date to ensure the policy context is as up to date as possible. Currently it is anticipated that LDP2 will be formally adopted by the Council at some point in April 2024.

Landscape and Visual

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

The Applicant is advised to keep the cumulative situation under review during the preparation of the EIA Report as this is an evolving situation. In terms of the sites listed in Table 5.2, the Planning Authority would advise that Overhill wind farm now has a consent for 10 x 180m high turbines and an application for 10 x 200m high turbines (currently all as per the positions originally consented).

The Planning Authority does not agree that night time landscape effects can be scoped out as aviation lighting has an impact on the landscape character in addition to visual impacts.

Given the proposals to not include the turbines closest to Muirkirk then the Planning Authority agrees that standard viewpoint visualisations from Muirkirk would be sufficient without the need to a full townscape assessment.

The Planning Authority would agree in principle to the list of viewpoints currently set out but would request further consideration of these, in addition to night time viewpoints in due course as some limited additional viewpoints are likely to be requested. As the design evolves, it would be useful to agree a final set of viewpoints with the Planning Authority and relevant surrounding authorities and NatureScot at that time at the design freeze to ensure the LVIA / RVAA is based on an agreed set of viewpoints at that point. The Planning Authority would request a night time viewpoint within the East Ayrshire district to coincide with visibility of turbines. Based on the ZTV (Figure 5.1) this might be one of either VP5, VP6 or VP8, depending on the extent of visibility of lighting.

Ecology and Nature Conservation

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

The Planning Authority has nothing further in particular to advise in respect of the updated Phase 1 proposals though would note that NPF4, Policy 3 now expects significant biodiversity enhancement including nature networks to be delivered. Therefore, the Planning Authority would expect that mitigation / habitat management measures would need to be ambitious and go beyond mitigation of impacts but deliver substantially improved habitats / biodiversity on site and this should be taken into account when detailing what biodiversity enhancement measures are proposed to be delivered as part of the proposed development.

Ornithology

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

Noise and Vibration

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration. The Planning Authority continue to advise that discussion with the Council's independent noise consultant shall take place in agreeing to any noise monitoring locations or assessment methodology, in conjunction with the Council's Environmental Health Service.

Cultural Heritage

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

Hydrology, Hydrogeology and Geology

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration. The Planning Authority would note that NPF4 now has Policy 33 for Minerals with specific reference to borrow pits and the matters that will need to be assessed / considered in such proposals. The Applicant is advised to take this into account.

Traffic and Transport

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

Aviation and Radar

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

The Planning Authority would note other Section 36 wind farm applications have proposed aviation activated lighting as a form of mitigation for visible aviation lighting and it is understood that the Civil Aviation Authority (CAA) are in the process of consulting on a draft policy statement which would allow for the use of aviation activated lighting. It would be expected that every effort is made to reduce the impacts of visible aviation lighting as far as possible, particularly given the substantial increase in cumulative pressure/impacts from visible aviation lighting associated with large numbers of wind farm proposals / consents for turbines over 150m in height.

Forestry

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

Shadow Flicker

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

The Planning Authority would reiterate that no level of shadow flicker is considered acceptable in this country and that all shadow flicker will require to be mitigated.

Other Technical Assessments

The Planning Authority would note its comments from the previous scoping response (22/0003/S36SCP) remain valid in respect of the various subject matters listed under the Other Technical Assessments section of the scoping report unless otherwise updated herein based on the revised Phase 1 proposal currently under scoping consideration.

Closing Comments

The Planning Authority would also advise that the comments from the previous scoping response (22/0003/S36SCP) remain valid for any other matters discussed therein which have not been specifically discussed or addressed in the revised Phase 1 scoping report submitted for consideration.

The Applicant is advised to ensure that all requirements of the up to date regulations and guidance is complied with in undertaking the EIA and subsequent compilation of the EIA Report. The Applicant is advised to contact the relevant consultees to seek their views/input into the various chapters to ensure all matters raised are adequately dealt with and based on as up to date a position as possible. The Planning Authority would again advise that the Council's LDP2 is likely to be adopted in April 2024 and should be considered as part of any policy assessment within the EIA Report on the understanding LDP2 is likely to be adopted in advance of any application submission for the Hagshaw Cluster Phase 1 to the Scottish Government.

Yours faithfully

Graham Mitchell
Interim Team Leader

Appendix 1 – suggested additional consultees

East Ayrshire Council Access Officer;

Ayrshire Roads Alliance;

Scottish Power Energy Networks;

Scotland Gas Networks;

The Coal Authority;

East Ayrshire Council Environmental Health Service;

Nith District Salmon Fisheries Board;

River Doon Salmon Fisheries Board;

Ayrshire Rivers Trust;

Scottish Wildlife Trust, and

Local community councils (9CC).

A8

Community And Enterprise Resources
Executive Director **David Booth**
Planning And Regulatory Services

Scottish Government
Energy Consents Unit
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

Our Ref: P/24/0224
Your Ref:
If calling ask for: Stuart Ramsay
Date: 14 March 2024

Dear Sir/Madam

Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017
Regulation 17 - Scoping opinion request

Proposal :	Scoping opinion request for proposed section 36 application for the erection of up to 26 turbines, solar PV array, on-site energy storage and associated infrastructure (Scottish Government Consultation)
Site address :	Hagshaw Energy Cluster, Douglas
Application no :	P/24/0224

I refer to your request for a scoping opinion which was received on 21 February 2024 .

A formal response to the request will be provided within five weeks from the date received, or such longer period as may be agreed in writing with yourself.

If we need additional information in order to adopt a screening opinion, we will contact you within 21 days of the date of receipt of your scoping request.

If you wish to keep up to date with the progress of your request, you can call the telephone number at the top of this letter quoting your reference number, or check the Council's Planning Portal at www.southlanarkshire.gov.uk

Yours faithfully

Area Manager

Privacy Notice – Planning applicants

Using Your Personal Information

We will use the information you have given us to process the application you have submitted to us.

Floor 6, Council Offices, Almada Street, Hamilton, ML3 0AA
Email stuart.ramsay@southlanarkshire.gov.uk Phone: 07551840251

We are required to keep a register of planning applications under section 36 of the Town and Country Planning (Scotland) Act 1997. The information that comprises the register is set out in Schedule 2 of the Town and Country Planning (Development Management Procedure)(Scotland) Regulations 2013. These records are made public and will be published and available to view on the Council's website.

Once a decision has been made on an application, information and documents will be retained and archived. We may also use personal information for historical, research or statistical reasons.

We will only process your personal information when it is lawful to do so.

Your rights

You have the right to ask us to

- confirm that we are using personal information about you, detail what that information is, to whom we have disclosed your information and a copy of the information that we have about you (The right of access)
- correct any incorrect or misleading personal information that we have about you (The right to rectification)
- stop using any or all of your personal information (The right to object)
- delete or destroy your personal information (The right to erasure) and
- stop using your personal information until we can look into correcting your personal information or our justification for using your personal information or to stop us deleting your personal data where you need it in connection with any legal claims (the Right of Restriction) and
- pass your personal information to someone else

For more information on your rights and how to exercise them or for information about how we manage your personal information, you can access the Council's Privacy Notice on the Council's website or you can ask for a paper copy from the Data Protection Officer (details are below).

If you have any queries or are unhappy about the way that we use your personal information or have responded to you in relation to any of your rights, you can contact

The Council's Data Protection Officer

The Data Protection Officer,
Administrative and Legal Services,
Finance and Corporate Resources,
Floor 11,
Council Offices,
Almada Street,
Hamilton
ML3 0AA

Tel: 0303 123 1015

Or by email to dp@southlanarkshire.gov.uk

A10

From:	Robins, Paul (NRS)
To:	Ramsay, Stuart; Planning
Subject:	P/24/0224 - Scoping opinion request for proposed section 36 application for the erection of up to 26 turbines, solar PV array, on-site energy storage and associated infrastructure (Scottish Government Consultation) | Hagshaw Energy Clus (OFFICIAL)
Date:	10 April 2024 11:16:09
Attachments:	image001.png

OFFICIAL

Dear Stuart,

I refer to the above scoping request and report sent to the West of Scotland Archaeology Service for comment.

I write to advise that, subject to the views of Historic Environment Scotland regarding the setting of designated sites, I generally agree with the proposed scope of the assessment for cultural heritage.

There are some minor clarifications required such as the extent of previous surveys and the extent of LIDAR coverage referred to and the treatment of currently forested areas but these can be sorted out for the EIA by the further consultation suggested and welcomed.

Regards

Paul

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Planning application P/24/0224, Hagshaw Energy Cluster Douglas.

Comments for the scoping opinion - welcome the changes to the original proposal to remove the turbines from the designated sites.

I have attached a report entitled 'potential ecological impacts of ground mounted photovoltaic solar panels - An introduction and literature review BSG Ecology'. The report identifies various ways in which solar energy can cause impacts on biodiversity. These include direct mortality (through collision), habitat loss / fragmentation, alteration of habitat quality, species assemblage changes, microclimate disturbance and pollution. In turn, these effects can cause reduced connectivity between populations in some species. Of particular note is the possible adverse effects that the presence of PV solar panels in the countryside could have on aquatic invertebrate populations.

Considering the scale and proximity of the solar panels to the Greenock Water and other watercourse, I would like to see more information on the potential impact on the aquatic biodiversity. Research suggests that the panels may appear more attractive to aquatic insects than neighbouring water bodies, as polarized light appears to be one of the most important sensory cues used by aquatic invertebrates when identifying water bodies, which may be used as egg-laying sites, artificial sources of highly polarised light could potentially impact aquatic invertebrate populations by inducing egg-laying in locations where survival is unlikely.

Regards

Jo

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BSG | ecology

Potential ecological impacts of ground-mounted photovoltaic solar panels

An introduction and literature review

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Client	BSG Ecology
Job	An introduction and literature review
Report title	Potential ecological impacts of ground-mounted photovoltaic solar panels
Draft version/final	FINAL
File reference	Solar Panels and Wildlife Review 2019

	Name	**Position**	**Date**
Originated	Rachel Taylor	Senior Consultant	16 December 2013
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Disclaimer

Contents

1 Introduction

1.1 As the number of solar parks in the UK increases, there is growing interest in the interaction of wildlife with ground-mounted photovoltaic (PV) solar panels. To date, a relatively limited number of research papers have formed the basis for considerable discussion on the subject, and in some cases these have informed guidance relating to PV solar parks in the UK.

1.2 The aim of this document is to identify potential ecological issues of solar PV (as relevant to the UK), and identify current gaps in our knowledge. This review is an update to the original text published in January 2014 (Taylor *et al.*). Readily available papers on interactions between PV solar panels and ecological features including invertebrates, birds and bats have been collated in order to critically appraise the evidence base. Where apparent, conclusions are drawn on effects on local biodiversity.

Background

Solar PV in the UK

1.3 Solar PV is an important source of renewable energy in the UK, and one which is key to maintaining progress in the gradual transition from fossil fuels to other sources of power. In 2018 the Committee on Climate Change (CCC) issued a report to Parliament, which stated that solar photovoltaic systems had reached an installed capacity of 12.8 GW and accounted for 4% of UK energy generation in 2017. The report also stated that the expected installed capacity in 2020 would reach 13 GW.

1.4 This current and predicted capacity falls below the targets set by Government in May 2012. At that time the Government, announcing their updated renewable energy road map stated that up to 22GW of solar energy would be an achievable ambition by 2020 (DECC, 2012). The more modest growth in solar than anticipated in 2012 is likely to be due to the ending of subsidies for PV projects (Stoker, 2019).

1.5 There is likely to be a renaissance in the solar market in 2019, however. The Solar Trade Association said in late 2018 “Solar could soon be the cheapest form of electricity generation in the UK. A significant solar pipeline is widely expected to restart in the UK in 2019, assisted in the short term by developer needs to build out previously stalled projects and by a global module surplus. In the medium to longer term, the market outlook is supported by improved manufacturing efficiencies, higher gas price projections and the UK’s growing need for clean generation capacity.”

Solar Technologies in the UK

1.6 Solar energy can be utilised in a number of ways, including:

- Solar thermal systems – using solar energy to heat water or air which is then used to heat buildings.
- Concentrated solar systems – concentrating sunlight to superheat a fluid, which is then used to boil water, which in turn runs a generator and produces electricity.
- Photovoltaic (PV) systems – solar cells convert sunlight directly into electricity, by harnessing the current produced by electrons being knocked off the atoms of photosensitive materials such as Selenium.

1.7 In the UK the most common type of solar installations are PV systems, sometimes combined with thermal. A report released by the Committee on Climate Change in 2011 stated that concentrated solar systems are not suitable for use in the UK, as the technology requires intense sunlight and little cloud.

Assessing Solar Impacts on Biodiversity

1.8 The scope of any ecological assessment will depend on the type of development proposed and the method of construction. There are different ways of installing solar panels, and the ecological impacts of these vary. In the UK, photovoltaic/thermal solar panels can be installed in several forms (Li *et al*. 2013):

- Domestic – principally fixed on the roofs of domestic buildings. PV installations of this type can be as large as 4kW capacity.
- Building mounted – PV systems on commercial/non-residential typically range from 4kW to 100kW capacity, although larger buildings can accommodate larger arrays up to 5MW.
- Building Integrated – building materials that have a PV component built into them, such as roofing tiles.
- Ground-mounted – these generally supply power at a grid distribution level. They often span over a large area, with the land required for a 1MW fixed tilt array with security fencing currently being approximately 2.4 ha.

1.9 This review discusses some ecological considerations associated with the interaction of wildlife with ground-mounted PV panels. Ground-mounted PV panels have the potential to cause the highest impact on nature as they are installed on land which may have at least some value to wildlife. The other forms of installation are all reliant on built infrastructure, and are likely to be limited in their ecological impacts for this reason (Dale *et al*. 2011).

1.10 The potential impact of ground-mounted PV panels on ecological features has been the subject of media interest previously. Despite the occasional hiatus with regard to the findings of some studies and the production of industry guidance, there seems to be little empirical data on the subject. At times, it would also appear that the limited available research available has been stretched to address gaps in knowledge.

1.11 This article critically reviews the studies that have received the greatest amount of interest; these are principally concerned with aquatic invertebrates, birds, bats and effects on local biodiversity.

2 Research Review

Aquatic Invertebrates

Evidence of Invertebrate Attraction to PV Panels

2.1 At present there is limited evidence regarding the possible adverse effects that the presence of PV solar panels in the countryside could have on aquatic invertebrate populations. In 2010, Horvath *et al*. released a paper about the possible attractiveness of solar panels to aquatic invertebrates, from experiments conducted next to a river (from which the invertebrates emerged) in the Hungarian Duna-Ipoly National Park. The authors found that the homogenous black panels used in that particular study reflected horizontally polarized light at a higher percentage than water. It was postulated that the studied panels may therefore appear more attractive to aquatic insects than water bodies. As polarized light appears to be one of the most important sensory cues used by aquatic invertebrates when identifying water bodies, which may be used as egg-laying sites, artificial sources of highly polarised light could potentially impact aquatic invertebrate populations by inducing egg-laying in locations where survival is unlikely (Schwind, 1991; Horvath and Varju, 1997; Heinze, 2014).

2.2 In the paper by Horvath *et al*. (2010) experiments were carried out to test the attractiveness of solar panels to mayflies, caddis flies, dolichopodids, and tabanids. The experiment found some evidence that mayflies (Ephemeroptera), stoneflies (Trichoptera), dolichopodid dipterans, and tabanid flies (Tabanidae) were attracted to solar panels and did exhibit egg-laying behaviour above solar panels more often than above surfaces with lower degrees of polarisation. Specific counts of eggs on solar panels were not undertaken during this experiment and it was assumed by the authors of the paper that eggs were laid following observation of egg-laying behaviours.

2.3 The research investigated the attractiveness of panels that reflect highly polarised light rather than their ecological impacts. The results of the research led the authors to the conclusion that some consideration would be appropriate in the siting and design of solar panels where important populations of aquatic invertebrates are likely to be present locally. This recommendation was quoted in a European Commission news alert (European Commission, 2011) and in a briefing note released by the RSPB (RSPB, 2011).

2.4 Farkas *et al.* (2016) looked at sensitivity to polarised light in two mayfly species, *Ephoron virgo* and *Caenis robusta*[1], at three sites in Hungary. These species were chosen as they belong to different families and occur in different habitat types; the larvae of *E. virgo* develop only in rivers, while *C. robusta* larvae occur in streams, still waters and rivers. Similarly to the studies mentioned above, horizontally polarised light was much more attractive than vertically polarised light or unpolarised light. A key observation during this study was that the shadow and reflection of riparian vegetation at the edges of water bodies reflect weak, vertically polarised light; flying mayflies use this stimulus to avoid the edges and remain continuously above the water surface. If the mayflies were not to use this stimulus, they might lay their eggs on the muddy substrate at the edge of the waterbody, which is not suitable for the development of their larvae.

2.5 A study in Budapest by Egri *et al.* (2016) investigated the sensitivity of the springtail *Podura aquatica* to polarised light. The study found that horizontally polarised light was most attractive to *P. aquatica* and vertically polarised light least attractive. Unpolarised stimulus elicited moderate attraction. A key finding of the study was that horizontally polarised light was more attractive than unpolarised light, even when the polarised stimulus was ten times dimmer. This behaviour in other Collembola species has been studied (Shaller, 1972; Salmon & Ponge, 1998; Dromph, 2003; Fox *et al.* 2007), and the results show that only species living on water surfaces/plants are attracted to horizontally polarised light. The majority of springtails are found in soil, therefore horizontally polarised light indicates inappropriate habitat and is avoided (Egri *et al.* 2016). The life cycle of *P. aquatica* is strongly water-dependent, so attraction to horizontally polarized light reflected from solar panels could result in significant population level effects if they are chosen over water-bodies.

[1] *C. robusta* are also found in the UK, with the majority of records from the South East of England (The Riverfly Partnership http://www.riverflies.org/caenis-robusta-anglers-curse).

2.6 The potential attraction of invertebrates to highly polarised reflected light occurs with many man-made surfaces, such as, asphalt roads, parked cars and glass buildings (Kriska *et al.,* 1998; Wildermuth, 1998; Kriska *et al.,* 2006; Kriska *et al.*, 2008). It would therefore be difficult in some locations, without very careful experimental design, to determine if population changes were due to polarised light from a solar park or other man-made features. Furthermore, in order to assess the impacts of a solar park, other variables affecting aquatic invertebrates would also need to be monitored and taken into account, such as the water quality of existing water bodies, which can have substantial effects on invertebrate species populations and diversity (Sundermann *et al.,* 2013).

2.7 It is unclear whether impact susceptibility varies between still water and fast flowing water species although it could be hypothesised that the likelihood of an ecological effect occurring (if one does occur), would be greater in close proximity to still and slow-moving water habitat as the solar array may superficially appear to be a slow moving or standing water-body as oppose to a riverine habitat.

Reducing Invertebrate Attraction to Solar PV Panels

2.8 Horvath *et al.* (2010) noted that for polarising surfaces that were broken by a white border or grid, the occurrence of egg laying behaviours was reduced. The study found that "*The highly and horizontally polarising surfaces that had non-polarising, white cell borders were 10- to 26-fold less attractive to insects than the same panels without white partitions*". Moreover, the polarisation of light by these broken surfaces appeared from the results to be less than water. As most existing and proposed solar parks in the UK employ grid-formed panels with anti-reflective films it is likely that the reflection of polarised light from these surfaces is already substantially reduced.

2.9 It has been suggested that anti-reflective coatings (ARCs) reduce the amount of polarised light pollution (PLP) that they reflect, and thereby their attractiveness to aquatic insects. Szaz *et al.* (2016), working in Hungary, investigated the attractiveness of panels with ARCs compared to uncoated panels. The responses of populations of mayflies (Ephemeroptera), horseflies (Tabanidae) and non-biting midges (Chironomidae) were considered. The study used artificial test surfaces which mimicked the optical properties of coated and uncoated solar panels. These surfaces were tested for their polarisation properties from all angles of view and in sunny and overcast conditions. Coated and sunlit solar panels were strong sources of horizontally polarised light only when the sun was ahead and behind, while uncoated panels exhibited high levels of horizontally polarised light from all angles. Under overcast skies, both the coated and uncoated panels reflected moderate levels of horizontally-polarised light.

2.10 The results revealed that horseflies showed a reduced attraction to coated panels, there was no difference in attractiveness of coated and uncoated panels to midges, and mayflies actually showed a preference for coated panels under overcast skies. These results led the authors to conclude that ARCs are most likely to benefit aquatic insects under sunny skies, for example in arid desert conditions, and when used in conjunction with other methods, such as white non-polarised gridding. The authors also warned that using ARC panels could cause adverse effects under overcast conditions for certain species. The authors suggest that, until more research on a variety of species has been carried out, a more sensible approach would be the strategic deployment of solar panels away from water-bodies in temperate regions.

Evidence of Invertebrate Habitat Fragmentation

2.11 Research by Ewers *et al.* (2006) indicated that species responses to habitat loss / fragmentation are mediated by their life history traits, for example sedentary and specialist species are more affected by habitat fragmentation than more mobile and generalist species. Given that butterflies are widely acknowledged to be sensitive to habitat fragmentation,

2.12 Guiller *et al.* (2017) tested this theory by studying the impacts of Utility-Scale Solar Energy (USSE) on butterfly community (Rhopalocera) movement in Mediterranean agro-ecosystems. The aim of the study was to provide developers with a decision-support tool to mitigate the environmental impacts of solar energy. The authors used resistance-based algorithms to model landscape connectivity, and looked at butterfly communities within pair-wise transects in an 18 Ha solar plant in France. The results suggested that both mobile and sedentary species coped with changes in landscape structure.

Summary

2.13 All of the studies on aquatic invertebrates that are referred to in this review were based in Hungary. However, the species / species groups that were studied are also present in the UK and of relevance in a UK context.

2.14 The Hungarian research has showed that aquatic invertebrates are attracted to horizontally polarised light (as reflected from both water bodies and solar panels), and use this as stimulus to induce egg-laying. White gridding and anti-reflective coatings were found to decrease the attraction of some invertebrate species to solar panels. Anti-reflective coatings were not found to deter all invertebrate species, namely mayflies and midges, under all conditions.

2.15 It follows that it is important to site solar farms away from important / sensitive aquatic invertebrate populations.

2.16 No studies showing landscape-scale impacts on invertebrates relevant to the UK have been located as a result of this review.

Birds

Effects of Mirrored Light on Birds

2.17 One of the most high profile issues regarding birds and solar parks in recent years has been the effect of light reflected from mirrored heliostats[2], which can singe a bird's wings. Most of the articles available draw upon one document, by McCrary *et al.* (1986) which reports on bird mortality at the Solar One facility in the Mojave Desert, California. This is a concentrated solar system, which uses mirrors to concentrate sunlight onto a central tower containing a fluid which is heated and subsequently used to heat water which powers a turbine. This type of solar park is not present in the UK.

2.18 McCrary *et al.* (1986) found that during approximately 40 weeks of survey, 70 bird fatalities were recorded as a result of collision with solar park infrastructure or burning at standby points. The most frequent form of avian mortality was due to collision (81%), the majority of these collisions being with the mirrored heliostat panels. This might be expected, as birds have commonly been recorded colliding with other highly reflective infrastructure such as windows and buildings (Klem, 1990; Dunn, 1993; Erickson *et al*., 2001). McCrary *et al.* (1986) also reports that there were thirteen instances of burning recorded in the heliostat standby points (limited temporary, areas of the sky on which the reflection from the heliostats are focussed during maintenance, testing, etc.) apparently due to birds flying through the heated air. The study concludes that the low number of mortalities from burning is due to the infrequent use of the standby points, and their varying intensity when being used. From the results shown by McCrary *et al.* it is reasonable to assume that by conducting maintenance at times of low light intensity, these incidents could be avoided. Evidence from grey literature (Upton, 2014) also suggests that focusing no more than four mirrors onto any one point during standby can significantly reduce the number of burning mortalities.

2.19 To reiterate, the study applies to large concentrated solar arrays, which are unlikely to be used in the UK. The burning observed cannot occur at photovoltaic solar parks as concentrating reflected light is not part of the design. PV solar panels are designed to absorb as much light as possible, and most are coated with an anti-reflective film for this reason. There has been research to better develop anti-reflective films that will increase the efficacy of solar panels (Achtelik *et al.,* 2013; Li *et al*., 2013). In addition, the grid-like panel design means that any reflection could be fragmented, a principle applied to windows in order to reduce collision events (Klem, 2009; Sheppard, 2011).

Bird Collision with Solar PV Panels

2.20 The solar parks to which the papers below refer are extremely large projects, built in open savanna or desert habitat. It is difficult to directly compare the impacts of such solar parks with those existing or proposed in the UK due to significant differences in scale and habitat. However, there is some evidence that bird collisions with PV solar parks occur, therefore these studies have been included for completeness.

2.21 Media and grey literature reports indicate that water birds may confuse large solar arrays with water bodies; and of collisions with solar panels at large-scale PV solar parks. A study by Bernath *et al*. (2001) observed birds such as black kite and swallow attempting to drink from plastic sheets which led the authors to the hypothesis that these birds were attracted to sources of polarised light. It has been suggested that birds that drink on the wing, such as swallows, could be at risk of collision with solar panels (which also reflect polarised light), while there is unlikely to be a risk to birds that drink from a perched position (Harrison *et al.* 2017).

2.22 Very few relevant research papers were found during the data search for this review that substantiated these contentions. Furthermore, no studies from the UK or Europe were found.

2.23 Dwyer *et al.* (2018) considered the potential effects of renewable energy, including solar, on raptors. The authors make the point that effects such as direct mortality, habitat loss, avoidance and displacements rarely occur in isolation. The effects are usually additive, co-occurring with one another and other natural or anthropogenic causes of mortality. Some of their observations are based on research carried out by Kagan *et al.* (2014), which summarises data on bird mortality at three different solar energy facilities (one PV facility, one trough system with parabolic mirrors and

[2] An instrument consisting of a mirror moved by clockwork, for reflecting the sun's rays to a fixed point. During times when this energy is not needed, during maintenance for example, sunlight is reflected towards 'standby points', which are predetermined areas of open sky.

one solar flux tower) in southern California, USA. All three facilities experienced avian mortalities. Trauma was the leading cause of death at all three facilities, and the solar flux tower also included singeing injuries. Predation was also a cause of fatality, mostly at the PV facility, which in many cases was associated with stranding or non-fatal impact trauma with panels which leaves birds vulnerable to predation. During the study, the remains of 61 birds from 33 different species of varying size and flight / feeding behaviour were recovered at the PV facility. Superficially, this seems a high number of fatalities when considered in a UK context, however the PV facility (Desert Sunlight Solar Farm) is approximately 1,420 Ha in size (based on a review of aerial imagery), and located on a major bird migration route in desert habitat, so the number needs to be considered in this context.

2.24 Visser *et al.* (2019) investigated the effect of South Africa's largest PV facility (96 MW, 180 Ha) on birds. Bird species richness and density was found to be lower within the PV facility than the surrounding land. During 3 months of mortality surveys[3], eight bird carcasses of six different species[4] were found. Most bird fatalities were inferred from feather spots, with no fresh carcasses or evidence of damaged / imprinted solar panels. The authors comment that the causes of death for these birds were impossible to infer. Seven birds were found under solar panels, indicating that they either did not collide with the surface, or if they did they were moved by scavengers after collision. The remaining bird was found at the fence line. The authors extrapolated the number of carcasses found to give a mortality rate for the site of 435 birds per year, although they noted this number was likely to be a conservative estimate, given that detection probabilities were based on finding intact birds and decreased for older carcasses. Visser *et al.* (2019) recommend using Before-After-Control-Impact (BACI) study designs to assess how PV farms impact bird populations during both the pre-construction and operational phases of solar parks.

2.25 Walston *et al.* (2016) estimate that utility-scale solar energy-related avian mortality is considerably lower than mortality from other anthropogenic causes, such as road mortality, building collisions and wind / fossil fuel development. The study, based in California, combined bird mortality data from two concentrated solar facilities and one solar PV facility and demonstrates that bird fatalities can occur as a direct result of PV solar facilities, albeit in lower numbers than at concentrated solar facilities. The authors acknowledge the need for more research to better understand the risk of solar facilities to bird populations.

Bird Displacement by Solar PV Panels

2.26 Dwyer *et al.* (2018) also comment on the indirect effects of solar energy, including habitat loss, displacement and avoidance. There are a number of accounts of birds nesting on the structures that support solar panels including personal observations of such nesting by Hernandez *et al*. (2014). It is also reasonable to hypothesize that some ground-nesting birds would be attracted to solar parks due to the availability of a safe nesting area, as the security fencing around the solar parks may deter ground predators (Smith *et al.,* 2010). However, during a comparative study of 11 UK PV solar farms, Montag *et al.* (2016) found that skylark tended to use undeveloped control plots more than the solar farms. Montag *et al.* (2016) are of the view that ground-nesting birds need an unbroken line of sight and would therefore avoid nesting at solar farms.

2.27 DeVault *et al.* (2014) demonstrated that solar PV facilities could potentially alter the structure of bird communities. At five airport locations across the US, the diversity of species using PV array sites was lower than in adjacent grasslands (37 and 46 species, respectively). In contrast, bird densities at those PV array sites were more than twice those of adjacent grasslands. DeVault *et al.* (2014) suggest that shade and the provision of perches increased bird use of the PV array sites. However, the results were species-specific, with some small passerines more abundant at PV facilities compared with adjacent grasslands, but corvids and raptors less abundant. Raptor abundance was found to be higher pre-construction compared with post-construction at one site, suggesting avoidance of the facility. Solar facilities can often result in surrounding bare earth which

[3] The solar field divided into 3 sample areas. One set of solar arrays (representing 9-10% of each sample area) was searched every 4 days for the first 6 weeks and then every 7 days thereafter. The second set (8-10% of the total area) was surveyed every 14 days. Bird mortalities arising from other infrastructure within the solar field were also monitored e.g. the substation and evaporation pond (every 4 days), perimeter fence (divided into 3 sections – 55% checked every 4 days, 9% every 7 days and 36% every 14 days). Searcher efficiency trails and carcass persistence tests were also carried out but it is unclear how often.

[4] These species were fiscal flycatcher, red-eyed bulbul, Eastern clapper lark, orange river-francolin, speckled pigeon and crowned lapwing.

is unsuitable for hunting or nesting by raptors. Raptors may also avoid habitats in and around solar facilities as a result of increased human activity and habitat alteration (DeVault *et al.* 2014). This study gave no reference to the habitat management of the PV sites, indicating only that the adjacent grasslands had taller vegetation than the PV sites and were mowed at least once annually. It is therefore not possible to determine whether habitat alteration due to solar farm development was likely to have resulted in displacement effects.

Stakeholder Position

2.28 There does not appear to be any hard evidence to suggest that solar farms are likely to cause the displacement of bird populations in the UK. An RSPB policy briefing on solar (RSPB, 2014) concluded: "*If correctly sited (so as not to impact on sensitive species) and with appropriate land/habitat management and other mitigation measure employed, the deployment of solar might be of benefit to wildlife and the wider countryside. There is little scientific evidence for fatality risks to birds associated with solar PV arrays. However, birds can strike any fixed object so this lack of evidence might reflect absence of monitoring effort, rather than absence of collision risk. Structurally the risk is broadly similar to many other man-made features, though PV arrays may be more likely to be developed in sensitive locations. The RSPB would like to see investment in monitoring and developing our understanding of the collisions risks associated with solar PV*".

2.29 Birdlife Europe (2011) suggest that there could be significant negative impacts to bird species such as lapwing and skylark where solar panels are sited on farmland, with reduced opportunities for foraging, roosting and breeding. However, no scientific evidence to support this was presented in the document. Draft best practice guidelines provided by BirdLife South Africa (Jenkins *et al.* 2015) acknowledge the lack of sufficient data collection to enable analysis of the effect of solar energy on birds. The authors highlight the need to carry out thorough scoping and data collection, impact assessment, pre-construction and post-construction monitoring (for which the latter should effectively duplicate the baseline data collection work) of the site.

Summary

2.30 Most of the studies concerning solar impacts on birds are from large concentrated solar systems in the US, where bird mortalities caused by collision or singeing have been noted.

2.31 Very little research has been found on the effect of PV solar panels on birds. None of the studies that have been reviewed to inform this document were conducted in the UK. In general, the studies relating to PV panels are from very large solar farms in savanna or desert habitat, and are not comparable with the UK, due to large differences in solar farm scale, habitat type, and the local abundance and behaviour of birds.

2.32 It has been suggested that the most likely effect of PV solar panels in the UK is the displacement of birds due to habitat alteration, although there is also evidence to suggest that attractant effects may also occur for some species that use solar panels for shelter and nesting. A review published by Natural England (Harrison *et al.* 2017) suggests that the effects of solar development on birds are likely to be species-specific, depending on a species' spatial requirements and foraging behaviour. Most sources of information concur that there is lack of robust data on this subject.

2.33 The best practice guidelines by BirdLife South Africa, Birdlife Europe (2011), the RSPB Policy Briefing, and the Natural England review (Harrison *et al.* 2017) all highlight the need for both pre-construction and post-construction monitoring of sites in order to effectively study their impact on birds and to allow solar farms to be correctly sited to avoid sensitive species.

Bats

Bat Collision with Solar PV Panels

2.34 As for birds, some solar technologies not relevant to the UK, such as concentrated solar power towers, are likely to impact on bats (Manville II, 2016).

2.35 There has, however, been some concern that there may be collision fatalities at PV parks due to bats mistaking solar panels for water, and this is referred to in Natural England's technical advice note TIN101 (2011):

"*Very little research has been conducted to date, but one laboratory study undertaken by Bjoern Siemers and Stefan Grief [sic] (2010) showed that bats attempted to drink from the panels and occasionally collided with them. If the plates were vertically aligned they often crashed into them when attempting to fly through them. Juvenile bats are expected to be more prone to this behaviour*."

2.36 The paper by Greif and Siemers (2010) aimed to investigate an innate recognition of water bodies by bats. For this they observed the behaviour of 15 species of bat towards smooth and rough panels of wood, metal and plastic placed on a sand-covered floor. They observed that bats appeared to only attempt to drink from the smooth surface and not from the rough one. This suggests that the bats were mistaking the panels in this environment for water. However, there are a number points made in this paper which suggest that this mistake may not be made with solar panels in natural conditions (a hypothesis that was not tested in this experiment):

- The experiment was conducted in both low light levels and in complete darkness. The authors observed an increase of 60% in attempts at drinking from smooth panels in complete darkness. From this Greif and Siemers (2010) concluded that bats integrate information from several senses when forming a perception of their environment.

- The experiment relied on bats needing to drink, and therefore the bats had water withheld from them during the day and were released into the flight room in the condition they would be in after roosting for the day. In the wild, light levels at emergence could be relatively high, depending on the species of bat, so other senses (such as sight) may not be as limited as they were in the flight room.

- The bats did not have access to water during the experiment, and therefore they could not 'choose' between the plate and water; they just kept attempting to find somewhere to drink.

2.37 It is also worth noting that the panels of metal, wood and plastic were aligned horizontally on the floor, rather than vertically. There is also no mention of the bats colliding with the panels, although the authors note that on rare occasions, bats accidentally landed on the smooth plate, but continued to behave as though it was water after this.

2.38 Greif and Siemers (2010) conclude that bats have an innate ability to echolocate water, by recognising the echo from smooth surfaces, and that bats may therefore perceive all smooth surfaces as water. The authors do not suggest that bats will be negatively affected by this mistake. Russo *et al.* (2012) assessed the ability of bats to tell the difference between water and smooth surfaces in the wild. A water trough used by bats was covered with Perspex and another left open. A third water trough was half covered in Perspex, with the other half left open. There was no difference in numbers of bats visiting each trough. However, in this experiment, the authors found that having had a number of failed drinking attempts from the Perspex side of the trough the bats would either return to drink from the water side of the trough or leave the site in search of water elsewhere. There was no mention of bats colliding with the Perspex.

2.39 A more recent study by Grief *et al.* (2017) investigated how both smooth vertical surfaces and smooth horizontal surfaces can deceive bats. As bats have been known to collide into reflective surfaces such as windows (Stilz, 2017), the authors sought to determine how bats use these as sensory cues. By analysing the echolocation calls of bats during the experiments, the authors found that bats often mistake smooth vertical surfaces for open flight paths, resulting in collision. In support of their previous work, they also found that bats mistake smooth horizontal surfaces with

water bodies, eliciting drinking behaviour. Given that solar panels were not used in this study, and most PV solar arrays in the UK are tilted, no potential impacts to bats can be inferred from these results.

2.40 The review released by Natural England (Harrison *et al.* 2017) provides a table listing hypothetical causes of collision mortality for bats at PV solar farms and recommended experimental approaches to test each hypothesis. This table was modified from the approach for bat collision at wind farms provided by Cryan and Barclay (2009). Harrison *et al.* (2017) state:

"*In order to determine the impacts of solar PV developments on bats, experimental or observational research is urgently required and should be conducted on a species or guild basis in the UK due to behavioural differences and variation in ecological requirements. The hypotheses and experimental approaches presented in table 2 provide a rudimentary foundation for further research.*"

Summary

2.41 There has been no research that directly addresses the effect of PV solar facilities on bats. The studies above found that bats can mistake horizontal surfaces for water bodies and vertical surfaces for open flight paths, although there is no evidence to suggest that this would result in collision in the context of solar PV panels.

Biodiversity Impacts and Opportunities of Solar PV

The Nature of Biodiversity Impacts

2.42 Gasparatos *et al.* 2017 identified various ways in which solar energy can cause impacts on biodiversity. These included direct mortality (through collision), habitat loss / fragmentation, alteration of habitat quality, species assemblage changes, microclimate disturbance and pollution. In turn, these effects can cause reduced connectivity between populations in some species.

2.43 Natural England (2011) published a document that highlighted the negative impacts that solar development could have in areas of high ecological value or when sited close to designated sites. A subsequent Natural England review (Harrison *et al.* 2017) looked at the planning decisions for all solar PV development applications in the North West of England (as of July 2015) in order to determine how many applications were refused on an ecological basis. Of the 32 applications that had been processed at the time of data acquisition, 12 were refused planning permission, eight of which were refused for ecological reasons. The authors note that some applications were refused despite providing details for ecological mitigation.

2.44 There has been a lack of empirical research on the scale of environmental impacts of solar energy, however, with information mainly documented in grey literature. Furthermore, very little of this research has concerned biodiversity in the UK[5]. Throughout their review, Harrison *et al.* (2017) reiterate that the lack of scientific evidence relating to impacts on biodiversity is concerning, and that research should be undertaken to assess the impacts across a broad range of taxa at multiple geographical scales.

2.45 A study by Armstrong *et al.* (2016) looked at the effect of solar parks on microclimate and ecosystem processes under PV arrays, in the gaps in between and in control areas (sited on species-rich grassland) at Westmill Solar Park, UK. The authors did this by measuring soil and air microclimate, vegetation and greenhouse gas emissions over 12 months, with measurements taken from 12 randomly selected 1.5 m² plots (four from each treatment). They found that PV arrays caused seasonal and diurnal variation in soil and air microclimate. In summer, there was cooling (up to 5.2°C) and drying under PV arrays compared with gap and control areas. In winter, the gap areas were up to 1.7°C cooler compared with PV arrays and control areas. The diurnal variation in temperature and humidity was lower during the summer under the PV arrays. Species diversity and plant biomass was lower under the PV arrays. The authors noted that this was explained by differences in microclimate and vegetation management between treatments.

Minimising and Offsetting Impacts

2.46 The review by Gasparatos *et al.* (2017) suggests measures to mitigate the negative effects of solar energy on biodiversity. The primary suggestion was to locate solar energy facilities in areas supporting little biodiversity. This suggestion is feasible in countries such as the US where areas of desert habitat are available, and can be feasible in the UK if solar PV is sited on arable or improved pasture land with little biodiversity interest. DeVault *et al.* (2013) provide a case for installing solar facilities at airports, as they are some of the only land types where wildlife conservation is actively discouraged due to aviation safety concerns.

2.47 For situations where these recommendations cannot be achieved, Gasparatos *et al.* (2017) suggest developing biodiversity-friendly operational procedures. Once utility-scale PV plants have been installed, it is estimated that approximately 70-95 % of ground remains available, and that this has the potential to support wildlife and contribute to national biodiversity targets if good management practices are implemented (Esteves, 2016). The security and 20 year lifespan of completed sites, together with very little disturbance from humans or machinery, provides the potential for long-term benefits to biodiversity (RSPB, 2014). Recommended practices include the following (BRE, 2014; RSPB, 2014; Esteves, 2016)

- Installation / retention of boundary features such as hedgerows, ditches, stone walls, rough grassland, field margins and scrub.

[5] Most of the research has been carried out in arid desert habitats, with very few focused on temperate climates.

- Planting pollen and nectar strips
- Security fencing – plant growing climbers e.g. honeysuckle, and ensure there is 20-30 m gap between the base of the fence and the ground to allow small wildlife to pass through
- Grassland habitat – e.g. wildflower meadow and tussocky grassland
- Controlled grazing by sheep between panels, with a pause in spring and summer to allow vegetation growth
- Installation of artificial structures such as nest boxes, hibernacula and log piles.

Monitoring Studies

2.48 One comparative study from the UK, released by Montag *et al.* (2016) demonstrates how these management practices can have a positive impact on biodiversity at solar farms. The study investigates whether solar farms can result in greater biodiversity when compared with equivalent undeveloped sites. This study was carried out across 11 solar farms in the southern UK, all of which had been operational for at least one growing season but had varied approaches to their land management. The authors assessed the abundance and diversity of four key biodiversity indicators – plants, invertebrates (butterflies and bumblebees), birds and bats. Montag *et al.* (2016) categorised each site as having a low, medium or high level of land management for wildlife. This categorisation took account of positive / negative biodiversity management measures such as re-seeding grassland, grazing regimes, herbicide use and management of hedgerows / field margins.

2.49 The authors assessed changes in biodiversity by comparing the wildlife at the solar farm to that in nearby undeveloped control sites located within the same farms that were under the same management regimes as the solar farms prior to their construction. The botanical survey results showed that overall, solar farms supported a significantly greater diversity of species than control plots, especially for broadleaved plants. The authors comment that this was partly a result of re-seeding of species-rich wildflower mixes at the solar farms. Botanical diversity was also found to be influenced by management of the grassland with controlled grazing. There was no significant difference between plant diversity under panels and between rows. The authors suggest that this could be a case of niche selection, whereby more shade-tolerant plants are able to grow beneath the panels.

2.50 Generally, the study by Montag *et al.* (2016) revealed a greater diversity and/or abundance of invertebrate, bird and bat species on solar farms compared to the control plots. The greatest number of invertebrates occurred where plant diversity was also high. Overall there was a significantly greater abundance of invertebrates at solar farms than at control sites. There was no significant difference in invertebrate diversity between solar farms and control sites except for those solar farms assessed as having a high level of land management for wildlife. The bird survey results showed overall higher diversity found within solar farms compared with control plots, however this result was not significant. A significantly higher abundance of birds were observed at two solar sites compared with their controls. For these sites, it was suggested by the authors that there may be greater foraging opportunities which reflects the good grassland management practices and availability of structures for cover / perching. The solar sites were found to be of significant importance for declining farmland bird species, due to relief from intensive agricultural practices. The bat survey results suggested that a significantly higher abundance of bats are found over control areas as opposed to PV solar farms. However, the authors note that the results were inconclusive, as malfunctions in recording equipment resulted in limited data collection.

2.51 The three sites with the most focused management regime for biodiversity had the highest biodiversity level overall. This study provides evidence that solar farms can result in increased biodiversity if managed appropriately post-construction. The authors suggest that research should be conducted on a large number of UK sites with a broad age range in order to determine the relationship between site age and biodiversity level.

2.52 A similar (unpublished) study was undertaken by Parker & McQueen (2013) at four solar farms in comparison with control plots in southern England. All four solar farms were sited on previously arable land and all were subject to grassland management regimes; two were established as wild flower meadows and two were managed as pasture. The solar farms and control plots were

surveyed for bumblebees, butterflies and plant species. All four solar farms showed a form of biodiversity increase compared to the control plots. The wildflower meadow sites showed a significant increase in all three indicators, with less of an effect observed for the pasture sites. It is not clear how many times these surveys were repeated per site; however the authors acknowledge that their surveys were limited in sample size and duration. Despite this, the study used statistical analysis and showed that, in certain circumstances, solar farms can benefit biodiversity.

2.53 Guidance published by the BRE National Solar Centre (2014) provides advice to developers on how to effectively support biodiversity at solar farms. It states:

"*Biodiversity enhancements should be selected to fit the physical attributes of the site and should tie in with existing habitats and species of value on and around the site. Furthermore they should be compatible with the primary purpose of the site – to generate solar power. If agricultural production is also planned for the site, biodiversity enhancements should aim to dovetail with these goals*."

Data Gaps

2.54 With regards to future research on the effect of solar energy installations on biodiversity, a number of reviews (e.g. Hernandez *et al.* 2014; Grodsky *et al.* 2017; Harrison *et al.* 2017; Holland *et al.* 2018) recommend that studies focus on "bottom-up" ecological interactions, ecosystem-wide effects and landscape level impacts. The need to monitor sites both pre- and post-construction in order to produce robust results that are directly comparable has also been identified.

Summary

2.55 Very few studies were found that related to impacts on biodiversity in the UK.

2.56 Publications by Natural England recommend the avoidance of solar developments in or near to areas of high ecological value or designated sites, and highlight how planning applications can often be rejected based on the ecology of the proposed site.

2.57 The study at Westmill Solar Park, UK found that differences in plant biomass and plant diversity under PV arrays and in the gaps within the array could be explained by differences in microclimate and vegetation management. This is expected given that UK plant species are sensitive to significant changes in temperature and humidity.

2.58 In order to minimise the impacts of solar farms on biodiversity, the literature comes to a general consensus that:

a. Consideration should be given to the correct siting of solar farms within the landscape.

b. Biodiversity-friendly operational procedures, including managing the remaining land for wildlife, should be a priority and considered early in the planning process.

2.59 The comparative studies of solar farms across the southern UK provide evidence that positive outcomes for biodiversity can be achieved if such sensitive land management processes are implemented.

3 Conclusions

3.1 From the body of research reviewed[6] it is likely that the majority of concerns that have been discussed in the media are not well-founded, or are based on scientific experiments that were not specifically designed to evaluate ecological impacts of ground mounted solar PV sites.

3.2 Our original review, published in 2014, concluded that the ecological impacts of ground-mounted solar panels in the UK were relatively limited and location-specific. Five years on, the evidence base has not increased significantly (particularly with regard to UK studies), and most of the literature acknowledges the need for further research. The objectives and design of surveys and the development of ecological monitoring recommendations at ground-mounted PV parks should be considered on a case-by-case basis, to ensure that any design restrictions or mitigation / compensation measures are justified and effective.

3.3 We have reviewed the papers of ecological researchers and guidance from non-governmental organisations. These sources indicate that many authors see the installations of solar PV as an opportunity for biodiversity enhancement. This is broadly in line with what planning policy requires: e.g. The Environment (Wales) Act 2016 places emphasis on enhancing the resilience of ecosystems, while the National Planning Policy Framework (NPPF) 2019 refers to biodiversity net gain, stating:

"*Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity*."

3.4 In March 2019, DEFRA confirmed that the delivery of biodiversity net gain would be a mandatory requirement for all new developments in England.

[6] Some of the reports and ongoing monitoring mentioned in reviewed articles could not be located during this review, which restricts our ability to fully assess the potential impacts of ground-mounted PV solar panels. Notwithstanding this, the amount of research and monitoring data currently available appears to be too limited to allow definitive conclusions to be drawn.

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Subject:	RE: Hagshaw Energy Cluster - Western Expansion - scoping consultation response
Date:	15 May 2024 10:51:34
Attachments:	image002.png image003.png image004.png image005.png image006.png FW ECU00004623 - Hagshaw Energy Cluster - Application consultation from South Lanarkshire Council for application no. P240224 .msg

Hi Nicola,

Apologies for the delay in coming back to you on this point. We have had internal discussions with the project team ecologists as well as a call with Stuart Ramsey at South Lanarkshire Council in regards to the earlier comment made by the South Lanarkshire Council Biodiversity Officer (held 09 May 2024).

In relation to the BGS Ecology paper cited in the SLC email attached, we refer to the conclusion of the literary review which states that *"From the body of research reviewed6 it is likely that the majority of concerns that have been discussed in the media are not well-founded, or are based on scientific experiments that were not specifically designed to evaluate ecological impacts of ground mounted solar PV sites" (paragraph 3.1).* It goes on to say that *"the installations of solar PV [should be seen as] as an opportunity for biodiversity enhancement".* The Hagshaw Energy Cluster - Western Expansion project is currently reviewing the potential for habitat enhancement across the site and will be scheduling meetings with NatureScot, RSPB and SEPA in the near future to discuss our initial proposals which are likely to include bog restoration, wader management, wild seed grasslands and native landscape planting which will enhance the biodiversity of the current site, inline with the objectives of NPF4. Given the conclusion of that paper, we confirmed with Stuart at SLC that we do not propose to do any specific invertebrate survey work in this regard and Stuart seemed happy with that approach.

Stuart also noted that the council was still awaiting a number of internal responses to the Scoping update due to resourcing issues. We look forward in the meantime to receiving the ECU scoping opinion.

Thanks,
Theo

Theo Philip
Planning Director

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HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

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04 April 2024

Dear Nicola Ferguson

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
Hagshaw Energy Cluster Western Expansion, South Lanarkshire and East Ayrshire
Scoping Report

Thank you for your consultation which we received on 21 February 2024 about the above scoping report. We have reviewed the details in terms of our historic environment interests. This covers world heritage sites, scheduled monuments and their settings, category A-listed buildings and their settings, inventory gardens and designed landscapes, inventory battlefields and historic marine protected areas (HMPAs).

The relevant archaeological and cultural heritage advisors will also be able to offer advice on the scope of the cultural heritage assessment. This may include heritage assets not covered by our interests, such as unscheduled archaeology, and category B and C listed buildings. In this case, you should contact the West of Scotland Archaeology Service.

Proposed Development
We understand that the proposed development comprises the construction and operation of a mixed renewable energy development consisting of the following elements.

- Up to 26 wind turbines up to a maximum height of 230m to tip with associated access tracks, borrow pits, hardstanding's, infrastructure and substation.
- Solar photovoltaic panels and mounting frames with associated invertors, transformers, access tracks infrastructure and fencing.
- Battery Energy Storage System (BESS) and substation.

Scope of assessment
We welcome that the potential heritage effects are scoped into the Environmental Impact Assessment (EIA) report. However at this stage, based on the information provided within the scoping report, the development as currently proposed is likely to raise issues of national interest such that we are likely to object to an application in this form and location.

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

Consultation with the applicants regarding design refinements to mitigate negative impacts on assets within our remit are currently ongoing. The following comments relate to the scoping update report as consulted upon by the Energy Consents Unit (ECU) on 21 February 2024.

The attached annex provides information on the type and level of information required to inform the subsequent EIA report.

Further information
Guidance about national policy can be found in our 'Managing Change in the Historic Environment' series available online at www.historicenvironment.scot/advice-and-support/planning-and-guidance/legislation-and-guidance/managing-change-in-the-historic-environment-guidance-notes.Technical advice is available on our Technical Conservation website at https://www.engineshed.scot/.

We hope this is helpful. Please contact us if you have any questions about this response. The officer managing this case is Kevin Mooney and they can be contacted by phone on 0131 651 6787 or by email on kevin.mooney@hes.scot.

Yours faithfully

Historic Environment Scotland

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

Annex

Background
We previously responded to a scoping request (September 2022), for an earlier iteration of the proposed development. The proposed development comprised a mixed renewable energy development consisting of up to 72 wind turbines up to 230m in height, solar photovoltaic panels, onsite energy storage and a green hydrogen production facility, to a total of c. 0.65 GW capacity, with associated extensive infrastructure. In our response (26 October 2022), we highlighted that we were content with the scope of the proposed assessment and the methodology presented within the report. We also identified a number of assets that had the potential for significant impacts.

Scope of assessment
We welcome that the potential heritage effects are scoped into the EIA report, noting the reduction in turbine numbers to 26 and alterations to the proposed development. The applicant highlights that the updated scoping report for this consultation focuses on *'the changes to the baseline and assessment methodology'* outlined in the 2022 scoping report *(paragraph 9.1.1)*. We are content that the relevant updates referred to in Section 4 of the updated scoping report reflect current legislation and policy specifically references to National Planning Framework 4 (NPF4). We do note that references to Town and Country Planning (Scotland) Act 1997, previously referenced are no longer applicable due to the removal of elements of the proposed development (i.e. green hydrogen plant). We would also take the opportunity to highlight updates to our Designation Policy and Selection Guidance (4 December 2020) and our Managing Change in the Historic Environment: Setting (3 February 2020).

We note a discrepancy in the turbine numbering between the cultural heritage figures from all other chapter figures within the *scoping update*. For the avoidance of doubt, the following comments refer to the turbine numbers presented within *Scoping Update Figure 9.1 Cultural Heritage: Inner Study Area* and not those presented in the introductory chapters and the associated *Scoping Update Figure 3.1 Indicative Proposed Development Layout.*

Study areas
We welcome the updates to the study areas, which now reflect the new proposed development. We also note that the applicant references that *'Consideration will be given to designated heritage assets beyond 10km' (paragraph 9.5.1).* We are content that assets beyond the study area will be considered and have no further assets to add to the list.

Physical impacts
We can confirm that there are no World Heritage Sites, category A listed buildings, inventory garden and designed landscapes or inventory battlefields within the proposed

development boundary. As such, we are content that the proposed development should not result in any direct physical impacts on these assets. We note the presence of a single scheduled monument Dungavel Hill, cairn (SM2848) within the site boundary and that design of the proposed development has avoided any physical impacts on this nationally important asset. Mitigation must be put in place to ensure that there are no accidental incursions on this asset. This protection should also extend to any pre-construction ground investigation works, e.g. peat probing.

Setting impacts

Careful consideration should be given to reducing and avoiding impacts on the setting of cultural heritage assets during the design process. The following comments relate specifically to assets that have the potential for significant adverse impacts.

Dungavel Hill, cairn (SM2848)

The asset is the remains of a prehistoric ritual and funerary cairn built on the summit of Dungavel Hill. The proposed development layout almost completely surrounds the cairn and there is a strong risk that the size and placement of turbines could erode the sense of place and remoteness at the cairn. A key aspect of the setting of this asset is the clear visual relationship between the cairn and other cairns lying broadly to the south, including Glen Garr, cairn (SM2469), Blacksidend, cairn (SM2924), and Cairn Table, two cairns (SM4631). Cairn Table, two cairns lies approximately 12km to the southeast. We would request that a visualisation be provided that centres this important view and makes clear any potential impact on it.

Cairn Table, two cairns (SM4631)

The assets are two burial cairns of the late Neolithic/early Bronze Age, sited on the summit of the hill known as Cairn Table. The western cairn measures 12m in diameter and 1m high. The eastern cairn lies 30m to the east-northeast. It measures 16m in diameter and is 3.5m high. The hilltop location of these cairns provides wide ranging views across the area and intervisibility with other prehistoric monuments is an important aspect of its setting. The figure provided, *Scoping Update Figure 9.2 Cultural Heritage: Outer Study Area.* indicates that all parts of the proposed development, wind turbines, solar farm, and BESS/substation, would be visible from these cairns. We note that a visualisation from the location of this monument is proposed in the Landscape and Visual Impact Assessment chapter. We are content that the visualisation is included but request that reference to it is included for discussion in the Cultural Heritage chapter of the EIA report.

Our Advice

There is potential for significant adverse impacts on the setting of several assets because of the proposed development. Potential impacts on the integrity of setting of Dungavel Hill, cairn (SM2848) and Cairn Table, two cairns (SM4631) are of particular concern.Given the inconsistency of turbine numbering between the various documents submitted as part of this consultation all turbine numbers in the following discussion refer to the numbers as presented on *Scoping Update Figure 9.1 Cultural Heritage: Inner Study Area*.

Turbines to the southwest of Dungavel Hill, cairn, particularly **Turbine 6** , will need careful assessment to ensure there is no interruption of the views to and from other cairns in this direction, specifically Glen Garr, cairn (SM2469) and Blacksidend, cairn (SM2924). Significant impacts should be mitigated through design change.

Turbines to the southeast of Dungavel Hill, cairn, specifically **Turbine 8**, will need careful assessment to ensure there is no interruption of the views to and from Cairn Table, two cairns (SM4631). Again, significant impacts should be mitigated through design change.

To the east of the asset, **Turbine 9** is sited close to the cairn and at a much higher elevation than those at a corresponding distance to the west. Consequently **Turbine 9** has the potential to dominate the experience of being at the cairn. Consideration should be given to mitigating this negative impact through design change.

Historic Environment Scotland

04 April 2024

A40

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

By email to:
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Our case ID: 300061204

17 April 2024

Dear Ms Hudson

Hagshaw Energy Cluster Western Expansion – Updates to Proposed Development

Thank you for the meeting on 18 March 2024, which provided updates on the revised layout and visualisations for the application. We note that the original visualisations presented for our consultation incorrectly presented turbines with 200m tip heights. Subsequent visualisations passed to us on the 14 March 2024 were updated to provide an accurate representation of the proposed 230m tip height turbines.

We also welcome the updated visualisations produced *(P21-22921 Dungavel HillCairn Table_Photowires_Rev F Label)*, which now include the additional *(Sheet E)* visualisation for Cairn Table, two cairns (SM4631). We also welcome updates to the turbine numbering on figure *(HECWE_SiteLayout_AQv18_240325)* which will ensure consistency during any discussions and correspondence with consultees.

Proposed development

We note and welcome that our comments have been included in the recent design updates to the proposed development which now comprises 21 turbines up to 230m in blade tip height. These design updates have been presented in the revised layout figure *(HECWE_SiteLayout_AR_240319)* with corresponding wirelines produced for comparative purposes *(P21-2921 Dungavel HillCairn Table Comparative Wirelines_240325)*.

We understand that updates include the removal of **Turbine 3** and **Turbine 7**. We note that in order to improve the spacing between the remaining turbines, those turbines closest to Turbine 3 and Turbine 7 have also been adjusted in their position, taking cognisance of other known environmental constraints. We also note that a further three turbines were removed (**Turbine 16**, **Turbine 20** and **Turbine 22**) from the original design on ecological enhancement grounds).

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

Our advice
We welcome the ongoing commitment to engage with Historic Environment Scotland and to reduce negative impacts on heritage assets through the design process. This commitment has been reflected in the most recent updates.

Dungavel Hill, cairn (SM2848)
We welcome the positive changes made in the most recent design updates. The removal of Turbine 3 and the increased separation of Turbines 1 and 2 would reduce impacts on the key view from Dungavel Hill Cairn across the open landscape to the north-west. We particularly welcome the removal of Turbine 7 helping to preserve the intervisibility between Dungavel Hill, cairn (SM2848) and Cairn Table, two cairns (SM4631) to the south.

Our previous advice indicated that Turbines to the southwest of Dungavel Hill, cairn, particularly **Turbine 4** *(HECWE_SiteLayout_AR_240319)*, have the potential to interrupt key views between the cairn and other prehistoric monuments, specifically Glen Garr, cairn (SM2469) and Blacksidend, cairn (SM2924). Any forthcoming EIA report will need to consider any such impacts on the settings of these monuments.

To the east of Dungavel Hill, cairn, **Turbine 6** *(HECWE_SiteLayout_AR_240319)* is sited approximately 570m from the monument. Consequently **Turbine 6** has the potential to significantly impact the setting of the cairn by dominating the experience of being at the cairn. Assessment in any forthcoming EIA report should carefully consider the potential negative impacts of this turbine on the setting of the monument.

Yours faithfully

Historic Environment Scotland

17 April 2024

NatureScot
Scotland's Nature Agency
Buidheann Nàdair na h-Alba

Nicola Ferguson
Case Officer
Energy Consents Unit
The Scottish Government

20 March 2024

By email only

Our ref: CDM174312

Dear Nicola

Electricity Act 1989
The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
Request for Scoping Opinion for Proposed Section 36 Application for Hagshaw Energy Cluster – Western Expansion (Reference: ECU00004623)

Thank you for your consultation dated 21 February 2024 on the scope of the Environmental Impact Assessment (EIA) for the updated proposed Hagshaw Energy Cluster – Western Expansion. Thank you also for agreeing to an extension to our consultation period.

1. Background

1.1 NatureScot previously provided Energy Consents Unit with scoping advice in relation to a more extensive version of this proposal, which included proposals for infrastructure within the boundaries of the Muirkirk & North Lowther Uplands Special Protection Area (SPA) and the Muirkirk Uplands Site of Special Scientific Interest (SSSI), in our response dated 15 November 2022.

1.2 Since that response, during which time we have discussed the proposal with the applicant, the proposed development has been amended to now comprise:

- Approximately 26 wind turbines of up to 230m to blade tip, with a generating capacity of c. 187MW, in an area of Dungavel Forest extending to approximately 760ha.
- A solar array with a generating capacity of around 100MW and a battery energy storage system of c.200MW, in an area of agricultural land extending to approximately 205ha, and
- Associated infrastructure including foundations, hard standings, access tracks, construction compounds, cabling, fencing and substation.

1.3 We note that all elements of the proposed development lie outwith the boundaries of the SPA and SSSI and represent Phase 1 of the proposed development. Phase 2, which would be subject to a separate application for Section 36 consent, includes the land within the SPA/SSSI previously identified and is proposed to be brought forward "once the potential impacts on, and benefits to, the SPA and SSSI are further considered by all stakeholders". While we are happy to have further discussion with the applicant in respect of Phase 2, for the avoidance of doubt our advice in relation to potential development within the SPA/SSSI currently remains as set out in our scoping advice of November 2022 and discussed with the applicant.

2. Standing advice

2.1 The applicant should refer to our standing pre-application advice for both onshore wind farms[1] and solar farms[2]. These provide guidance, updated since the publication of National Planning Framework 4 (NPF4), on the issues that developers and their consultants should consider for wind farm and solar developments, including information on recommended survey methods, sources of further information / guidance, methods of assessment, and data presentation. Attention should be given to the full range of advice included in the guidance notes.

2.2 These guidance documents will be further updated over time to reflect any changes to available information and our guidance, so users should ensure they download the most up to date versions before use.

2.3 The full range of our standing advice and guidance can be found at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents.

3. Specific advice

3.1 The proposed scheme raises natural heritage issues that will require careful assessment as part of the EIA process. Some of these issues could lead to an objection from us if it is not possible to demonstrate that significant impacts can be adequately addressed through siting, design or other mitigation.

3.2 Much of the general advice given in our previous scoping response remains applicable to the development to now be brought forward. We offer the following updated and/or additional comments.

Muirkirk & North Lowther Uplands Special Protection Area (SPA)

[1] https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms
[2] https://www.nature.scot/doc/general-pre-application-and-scoping-advice-solar-farms

3.3 While Phase 1 of the proposal removes previously proposed infrastructure from within the site, there remains a connection between the proposal and the SPA's qualifying interests by virtue of its location on surrounding land within the core breeding season foraging ranges of the site's qualifying interests. This proposal is therefore likely to have a significant effect on all of the qualifying interests of the Muirkirk & North Lowther Uplands SPA. Consequently, Scottish Ministers, as competent authority, will be required to carry out an appropriate assessment in view of the site's conservation objectives for is qualifying interests.

3.4 To help you do this, we propose to carry out an appraisal to inform your appropriate assessment. The EIA Report must therefore contain the information required to undertake this appraisal in view of the site's conservation objectives for its qualifying interests. This should include information on, and an appraisal of, the following:

- Collision risk to SPA qualifying species and how this may affect the viability of the relevant species' population. This should include consideration of how collision risk may be influenced by forest or habitat management proposals resulting from the wind farm development (e.g. through the creation of additional areas of suitable nesting habitat within the wind farm site post-construction). For this proposal, we consider that it will be important to show the proposed turbine locations close to the SPA can allow for appropriate micro-siting and any habitat management that may needed to reduce the suitability of open ground around the turbines for nesting.
- Impacts on habitats supporting the qualifying species.
- Disturbance and/or displacement of SPA qualifying species as a result of construction, operation and/or decommissioning of the development. Allowing an appropriately sized buffer strip of trees to be retained between the turbines and the SPA boundary may assist in reducing the risk of displacement.
- Cumulative impacts.

3.5 When undertaking an appropriate assessment to ensure a proposal would not adversely affect the integrity of a European site, the competent authority can take mitigation measures into account. The EIA Report should be clear in respect of what any proposals for mitigation are, fully describe how these are to be delivered, and assess their likelihood of success.

<u>Other protected areas</u>

3.6 We are generally in agreement with the protected areas to be scoped into the assessment, and the issues to be considered in respect of these (as detailed in Tables 6.2 and 7.2 of the updated Scoping Report).

3.7 In respect of the North Lowther Uplands SSSI, the site lies between approximately 3km and 5km from any aspect of the proposed development (abnormal load proposed transport route). As such, in our view the proposed development is unlikely to impact on the notified features of this site, with the potential exception of indirect effects on the golden plover and merlin components of its breeding bird assemblage.

3.8 While we note that a blade lifter is to be used during transport along the A70, should any road works be required to facilitate delivery of development components impacts on Ree Burn & Glenbuck Loch SSSI may also require to be considered in the EIA Report.

Carbon-rich soils, deep peat and priority peatland

3.9 The findings from work undertaken to date, including Phase 1 and Phase 2 peat survey and National Vegetation Classification survey, should be used to inform the iterative evolution of the layout and design of the proposed development. The final siting and design of the proposed development, how this will affect peatland and how compliance with the mitigation hierarchy detailed in NPF4 has been achieved must be fully described and assessed in the EIA Report.

3.10 The applicant should refer to our updated standard pre-application guidance and our specific guidance on *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*[3] for our standing advice on:

- What constitutes carbon-rich soil and priority peatland habitat, and when impacts may raise issues of national interest.
- Complying with the mitigation hierarchy set out in NPF4.
- Key principles to consider in relation to habitat management to deliver offsetting and biodiversity enhancement. In respect of the this, we would particularly highlight that our current recommendation to achieve peatland offsetting (i.e. compensation, rather than biodiversity enhancement) would be in the order of 1:10 (lost:restored).
- Information to include with the EIA Report, including that on habitat management proposals.

3.11 As part of the EIA submission, we would request that the applicant completes the template in Annex 1 of the guidance. If the development infrastructure locations (including a 250m buffer) meet the criteria in the template, we would also request that an additional map is provided showing these locations (e.g. *Sphagnum* species) in relation to the development (if available, the separate provision of shape files showing the location of infrastructure, NVC communities and peat depths would also aid our assessment and would be welcomed).

Relationship with existing land management commitments

3.12 Development should endeavour to avoid undoing previous restoration, compensation or enhancement work where possible, and new habitat management proposals should seek to build on existing management commitments.

3.13 Due to the presence of publicly funded projects within and close to the application boundary, both Peatland Action and the Scottish Government Rural Payments and

[3] https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management

Inspections Division should be contacted for details of relevant Peatland Action and Agri-Environment Climate Scheme projects which may be affected by the proposed development and to discuss the implications of any such effects for individual projects and information/assessment requirements. The area benefitting from Peatland Action work is likely to extend beyond the actual restoration area boundary and this should be considered in the final siting and design of the development.

3.14 The proposed development also overlaps with, or is close to, existing wind farm sites where Habitat Management Plans (HMP) are in place (notably Dungavel Wind Farm, but also Kype Muir Extension and areas within the existing Hagshaw Cluster). The implications of this – for both the species/habitats being manged under these plans and their function in relation to the relevant consents - will require to be addressed in the iterative development of the proposal and within the EIA Report. In particular, the relationship between the proposed development and the commitments to habitat enhancement for hen harrier within the Dungavel Wind Farm HMP will require robust consideration, given that there appears to be both potential conflict and duplication between the proposal and this HMP.

Other natural heritage interests

3.15 Advice in relation to other natural heritage matters referred to in the updated Scoping Report are provided in Annex 1 of this response.

4. Concluding remarks

4.1 We hope that this advice, which is provided by NatureScot, the operating name of Scottish Natural Heritage, will assist you in your consideration of this scoping request. Should you wish to discuss it, or require any additional advice, please contact me at David.Kelly@nature.scot in the first instance.

4.2 We would also be happy to discuss the progression of this phase of the development and the information to be provided in the EIA Report with the applicant prior to submission, if they would find that helpful.

4.3 Finally, while we are supportive of the principle of renewable energy, our advice is given without prejudice to a full and detailed consideration of the impacts of the proposal if it is submitted as a formal application.

Yours sincerely

David Kelly
Area Officer, West Central Scotland

Annex 1

Landscape & Visual

We note that the ZTV provided as Figure 5.1 has been modelled on the basis of the proposed turbine height to blade tip. As such, we would welcome further engagement with the applicant, on production of a ZTV based on turbine hub heights, to agree locations for night-time visualisations. We would also be pleased to confirm the listed viewpoints are appropriate for the assessment of the solar array on receipt of a ZTV for this element of the proposal.

In respect of the matters proposed to be scoped out of the assessment detailed in Table 5.3 of the Scoping Report, as per our previous advice we would require further information in the form of baseline lighting intensity mapping to confirm that the proposal to scope out turbine lighting effects on landscape character is appropriate. More generally, we encourage the applicant to consider all mitigation options and present full details of the proposed lighting scheme in the EIA Report.

Ecology & Nature Conservation

Static bat surveys
We note that there is limited detector placement/coverage in the western side of northern development area in comparison with the area to the east. This is a potential limitation on the survey, the implications of which will require to be addressed in the EIA Report.

Roost surveys
We welcome that surveys for features with roosting potential have been undertaken since the previous scoping exercise. As per our standing advice, we recommend that if bats are present the species, numbers (or estimated numbers), function of the roost and flightlines away from the roosts should be established.

Ornithology

Vantage Point Surveys
While there is no need for a collision risk assessment in relation to the solar aspect of the proposal, we would welcome inclusion of flight line data from Vantage Point 3 in the EIA to provide contextual data on flight activity over the development area.

Biodiversity enhancement

As is noted in our standing pre-application guidance, The Scottish Government Draft Planning Guidance on Biodiversity (published November 2023) provides further advice on delivering biodiversity enhancement to clarify understanding of NPF4 Policy 3. Although labelled as “Draft Guidance” it is intended that it should be used now to assist in implementation and delivery of Policy 3.

We advise that:

- Development proposals should clearly set out the type and scale of enhancement they will deliver, ensuring that applications clearly distinguish between those elements mitigating or compensating for adverse effects and those delivering enhancement.

- Developers should prioritise on-site enhancement before off-site delivery. Where purely on-site enhancement is not possible, the Scottish Government draft guidance sets out further considerations for off-site delivery. Z

- It is also important that applications demonstrate that the enhancement is to be secured within a reasonable timescale and with reasonable certainty, including appropriate management and monitoring arrangements, and sustained for the future (preferably in perpetuity) in order to deliver a lasting legacy.

- Information on predicted losses, and the proposed mitigation, compensation and enhancement should be clearly set out, and also concisely summarised, in any application, so that this can be easily understood by decision makers.

- Enhancement requires consideration of all biodiversity, not just the significant effects that are the focus of EIA.

Our Developing with Nature guidance has been prepared, in discussion with Scottish Government, to support local development applications. It sets out several common measures to enhance biodiversity that are widely applicable. For national, major and EIA developments, more detailed assessment and more ambitious measures are likely to be required, but elements of this guidance may still be helpful.

Further information and updates are available via our enhancing biodiversity webpage.

A49

Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Nicola Ferguson
Energy Consents Unit

Our Ref: PCS-20000617
Your Ref: ECU00004623

SEPA Email Contact:
planning.south@sepa.org.uk

By email only to: Econsents_Admin@gov.scot

27 March 2024

Dear Nicola Ferguson

Electricity Act 1989 - Section 36
ECU00004623
REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION
HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION

Thank you for consulting SEPA for an Environmental Impact Assessment (EIA) scoping opinion in relation to the above development on 21 February 2024. We welcome engagement with the applicant at an early stage to discuss any of the issues raised in this letter and would especially welcome further pre-application engagement once further peat probing and habitat survey work has been completed and the layout developed further as a result.

National Planning Framework 4 (NPF4) has recently been published. The guidance referenced in this response is being reviewed and updated to reflect the new policies. It will still provide useful and relevant information, but some parts may be updated further in the future.

Advice for the planning authority / determining authority

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www.sepa.org.uk

We previously provided EIA scoping comments in relation to a proposal for up to 72 wind turbines and associated infrastructure (our reference 7026 dated 7 November 2022). The following comments should be read in conjunction with our previous response, which remains relevant. SEPA also met with the applicant in April 2023 to discuss the proposals.

The proposed development has now been amended to up to 26 wind turbines, associated infrastructure, solar, BESS and substation development and an updated scoping report has been submitted.

To **avoid delay and potential objection** the EIA submission must contain a scaled plan of sensitivities, for example peat, GWDTE, proximity to watercourses, overlain with proposed development. This is necessary to ensure the EIA process has informed the layout of the development to firstly avoid, and then reduce then mitigate significant impacts on the environment. We consider that the issues covered in Appendix 1 below must be addressed to our satisfaction in the EIA process. This provides details on our information requirements and the form in which they must be submitted.

We have also provided site specific comments in the following section which provides pre-application advice and can help the developer focus the scope of the assessment.

1. Site specific comments

Peat and carbon-rich soils (CRS)

1.1. Since our advice on the previous planning application, National Planning Framework 4 (NPF4) has been adopted and now forms part of the statutory development plan along with the Local Development Plan. Policy 5 of NPF4 covers soils and intends to 'protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development'.

1.2. In line with NPF4 Policy 5c development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for:

i. Essential infrastructure and there is a specific locational need and no other suitable site;

ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;

iii. Small-scale development directly linked to a rural business, farm or croft;

iv. Supporting a fragile community in a rural or island area; or

v. Restoration of peatland habitats.

1.3. We have provided the below advice on the basis that NPF4 Policy 5c exceptions apply, however it is for Energy Consents Unit, as the determining body, to confirm this. SEPA will object to any development on carbon rich soils which are not one of the development categories listed above.

1.4. We note Section 10.2.10 of the scoping report states “Class 1 and 2 peatland is considered nationally important priority peatland habitat. Class 3 to 5 is not considered priority peatland, though Class 3 peatland is associated with carbon-rich soils, with some potential areas of deep peat..”. We would emphasise that Class 5 peat soil is also important as a carbon store. NPF4 Policy 5 applies to all peat and carbon rich soils, therefore avoidance in the first instance and thereafter minimisation of impact to all carbon rich soils must be demonstrated.

1.5. Based on the phase 1 peat probing (fig 10.3) there appears to be deep peat across parts of the site. The indicative location of the 4 turbines newly positioned in the north west of Dungavel Forest appear to be on 0.5 – 1 m depth peat, where there appear to be shallower peaty soils nearby. Where there is scope to do so, design amendments to move these turbines onto shallower peat should be implemented to minimise peat disturbance as much as possible. The locations of turbines in the east and south of the Dungavel Forest area where the peat depths appear to be greater than 1 metre should be reviewed. The locations of the borrow pits should be also reviewed to reduce peat depth affected – in particular the location to the east of

the Dungavel Forest.

1.6. Figure 3.3 Indicative Wind Layout shows the indicative location of access tracks. It will be helpful to have this overlaid on the peat depth mapping at the EIA stage. Where the track crosses deeper peat seek to amend the layout to reduce the depth of peat affected, or adopt floating construction methods; for example, between T19 and T25, in the vicinity of T21 and of T23.

1.7. We would recommend the developer consider widening the phase 2 peat probing to include the micrositing tolerance as this may be helpful in demonstrating that the impacts on peat have been minimised

1.8. In terms of restoration, as set out above, avoidance must be considered as the first principle. Incursion of infrastructure into previously restored peatland areas must be minimised. Despite discussions regarding this at the April 2023 meeting, the proposed habitat management area in Dungavel Forest has not been modified to include the greatest depth of the peat deposit in the area. The EIA report must include explanation of the rationale for the habitat management area site location and extent. The submission should also consider how to mitigate the effects in the habitat management area due to drainage and forestry on the underlying peat which is adjacent to and continuous with the habitat management area.

1.9. The provided habitat mapping is sufficient for scoping stage; however we will expect this to be updated after felling has taken place and as additional information on likely groundwater dependency of wetlands becomes available. This must include further ecological detail in the habitat management area of Dungavel Forest and must include full coverage of the habitat management area to the west of the Netherwood southern development area.

1.10. The EIA report must include an outline peat management plan and an outline habitat management plan.

2. Regulatory advice for the applicant

2.1 Details of regulatory requirements and good practice advice, for example in relation to private drainage, can be found on the regulations section of our website. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the local compliance team at: sws@sepa.org.uk

If you have queries relating to this letter, please contact us at planning.south@sepa.org.uk including our reference number in the email subject.

Yours sincerely
Jessica Taylor
Senior Planning Officer
Planning Service

Ecopy to: nicola.ferguson@gov.scot

Disclaimer: This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. For planning applications, if you did not specifically request advice on flood risk, then advice will not have been provided on this issue. Further information on our consultation arrangements generally can be found on our website planning pages - www.sepa.org.uk/environment/land/planning/

Appendix 1: Detailed scoping requirements

This appendix sets out our minimum information requirements and we would welcome receipt and discussion around these prior to formal submission to avoid delays. There may be opportunities to scope out some of the issues below depending on the site. Evidence must be provided in the submission to support why an issue is not relevant for this site to **avoid delay and potential objection.** If there is a significant length of time between scoping and application submission the developer should check whether our advice has changed.

1. Site layout

1. All maps must be based on an adequate scale with which to assess the information. This could range from OS 1: 10,000 to a more detailed scale in more sensitive locations. Each of the maps below must detail all proposed upgraded, temporary and permanent infrastructure. This includes all tracks, excavations, buildings, borrow pits, pipelines, cabling, site compounds, laydown areas, storage areas and any other built elements. Existing built infrastructure must be re-used or upgraded where possible. The layout should be designed to minimise the extent of new works on previously undisturbed ground. For example, a layout which makes use of lots of spurs or loops is unlikely to be acceptable. Cabling must be laid in ground already disturbed such as verges. A comparison of the environmental effects of alternative locations of infrastructure elements, such as tracks, may be required.

2. Engineering activities which may have adverse effects on the water environment

1. The site layout should be designed to minimise watercourse crossings and avoid other direct impacts on water features. The submission must include a map showing:

a. All proposed temporary or permanent infrastructure overlain with all lochs and watercourses.

b. A minimum buffer of 50m around each loch or watercourse. If this minimum buffer cannot be achieved each breach must be numbered on a plan with an associated photograph of the location, dimensions of the loch or watercourse and drawings of what is proposed in terms of engineering works. Measures should be put in place to protect any downstream sensitive receptors.

2. Further advice and our best practice guidance are available within the water engineering section of our website. Guidance on the design of water crossings can be found in our Construction of River Crossings Good Practice Guide.

3. Refer to our Flood Risk Standing Advice for advice on flood risk. Crossings must be designed to accommodate the 0.5% Annual Exceedance Probability flows (with an appropriate allowance for climate change), or information provided to justify smaller structures. If it is considered the development could result in an increased risk of flooding to a nearby receptor then a Flood Risk Assessment (FRA) must be submitted. Our Technical flood risk guidance for stakeholders outlines the information we require to be submitted in an FRA. Please also refer to Controlled Activities Regulations (CAR) Flood Risk Standing Advice for Engineering, Discharge and Impoundment Activities.

3. Disturbance and re-use of excavated peat and other carbon rich soils

1. Where proposals are on peatland or carbon rich soils the following should be submitted to address the requirements of NPF4 Policy 5:

a. layout plans showing all permanent and temporary infrastructure, with extent of excavation required, which clearly demonstrates how the mitigation hierarchy outlined in NPF4 has been applied. These plans should be overlaid on:

i. peat depth survey (showing peat probe locations, colour coded using distinct colours for each depth category and annotated at a usable scale);

ii. peat depth survey showing interpolated peat depths;

iii. peatland condition mapping;

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iv. National Vegetation Classification survey (NVC) habitat mapping.

b. an outline Peat Management Plan (PMP);

c. an outline Habitat Management Plan (HMP).

Detailed advice

a. Development design in line with the mitigation hierarchy

2. In order to protect peatland and limit carbon emissions from carbon rich soils, the submission should demonstrate that proposals:

- Avoid peatland in near natural condition, as this has the lowest greenhouse gas emissions of all peatland condition categories;
- Minimise the total area and volume of peat disturbance. Clearly demonstrate how the infrastructure layout design has targeted areas where carbon rich soils are absent or the shallowest peat reasonably practicable. Avoid peat > 1m depth;
- Minimise impact on local hydrology; and
- Include adequate peat probing information to inform the site layout and demonstrate that the above has been achieved. As a minimum this should follow the requirements of the Peatland Survey – Guidance on Developments on Peatland (2017).

3. The Peatland Condition Assessment photographic guide lists the criteria for each condition category and illustrates how to identify each condition category. This should be used to identify peatland in near natural condition and can be helpful in identifying areas where peatland restoration could be carried out.

4. In line with the requirements of Policy 5d of NPF4, the development proposal should include plans to restore and/or enhance the site into a functioning peatland system capable of achieving carbon sequestration.

b. The outline PMP should also include:

- Information on peatland condition;
- Information demonstrating avoidance and minimisation of peat disturbance;

- Excavation volumes of acrotelmic, catotelmic and amorphous peat. These should include a contingency factor to consider variables such as bulking and uncertainties in the estimation of peat volumes;
- Proposals for temporary storage and handling;
- Reuse volumes in different elements of site reinstatement and restoration.

5. Handling and temporary storage of peat should be minimised. Catotelmic peat should be kept wet, covered by vegetated turves and re-used in its final location immediately after excavation. It is not suitable for use in verge reinstatement, re-profiling/ landscaping, spreading, mixing with mineral soils or use in bunds.

6. Disposal of peat is not acceptable. It should be clearly demonstrated that all peat disturbed by the development can be used in site reinstatement (making good areas which have been disturbed by the development) or peatland restoration (using disturbed peat for habitat restoration or improvement works in areas not directly impacted by the development, which may need to include locations outwith the development boundary).

7. The faces of cut batters, especially in peat over 1m, should be sealed to reduce water loss of the surrounding peat habitats, which will lead to indirect loss of habitat and release of greenhouse gases. This may be achieved by compression of the peat to create an impermeable subsurface barrier, or where slope angle is sufficiently low, by revegetation of the cut surface.

c. The outline HMP should include:

- Proposals for reuse of disturbed peat in habitat restoration, if relevant;
- Details of restoration to compensate for the area of peatland habitat directly and indirectly impacted by the development;

- Outline proposals for peatland enhancement in other areas of the site;
- Monitoring proposals.

8. To support the principle of peat reuse in restoration the applicant should demonstrate that they have identified locations where the addition of excavated peat will enhance the wider site into a functional peatland system capable of achieving carbon sequestration. The following information is required:

- Location plan of the proposed peatland re-use restoration area(s), clearly showing the size of individual areas and the total area to be restored;
- Photographs, aerial imagery, or surveys to demonstrate that the area identified is appropriate for peat re-use and can support carbon sequestration. This should include consideration of an appropriate hydrological setting and baseline peatland condition.

9. In addition, if any proposed re-use restoration areas are outwith the ownership of the applicant, information should be provided to demonstrate agreement in principle with the landowner, including agreed timescales for commencement of the works, and proposed management measures to ensure the restored areas can be safeguarded in perpetuity as a peatland.

10. NatureScot's technical compendium of peatland restoration techniques provides a useful overview of the procedural and technical requirements for peatland restoration.

4. Disruption to GWDTE and existing groundwater abstractions

1. Groundwater Dependent Terrestrial Ecosystems (GWDTE) are protected under the Water Framework Directive. Excavations and other construction works can disrupt groundwater flow and impact on GWDTE and existing groundwater abstractions. The layout and design of the development must avoid impacts on such areas. A National Vegetation Classification survey which includes the following information should be submitted:

a. A map demonstrating all GWDTE and existing groundwater abstractions are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all

excavations deeper than 1m and proposed groundwater abstractions. The survey needs to extend beyond the site boundary where the distances require it.

b. If the minimum buffers cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems for further advice and the minimum information we require to be submitted.

5. Forest removal and forest waste

1. If forestry is present on the site, we prefer a site layout which avoids large scale felling as this can result in large amounts of waste material and a peak in release of nutrients which can affect local water quality. The submission must include a map with the boundaries of where felling will take place and a description of what is proposed for this timber in accordance with Use of Trees Cleared to Facilitate Development on Afforested Land – Joint Guidance from SEPA, SNH and FCS.

6. Borrow pits

1. The following information should also be submitted for **each borrow pit**:

a. A map showing the location, size, depths and dimensions;

b. A map showing any stocks of rock, overburden, soils and temporary and permanent infrastructure including tracks, buildings, oil storage, pipes and drainage, overlain with all lochs and watercourses to a distance of 250m. You need to demonstrate that a site specific proportionate buffer can be achieved. On this map, a site-specific buffer must be drawn around each loch or watercourse proportionate to the depth of excavations and at least 10m from access tracks;

c. Sections and plans detailing how restoration will be progressed including the phasing, profiles, depths and types of material to be used.

7. Pollution prevention and environmental management

1. A schedule of mitigation supported by the above site specific maps and plans must be submitted. These must include reference to best practice pollution prevention and construction techniques (for example, limiting the maximum area to be stripped of soils at any one time) and regulatory requirements. They should set out the daily responsibilities of Ecological Clerk of Works, how site inspections will be recorded and acted upon and proposals for a planning monitoring enforcement officer. Please refer to the Guidance for Pollution Prevention (GPPs) and our water run-off from construction sites webpage for more information.

8. Life extension, repowering and decommissioning

1. Proposals for life extension, repowering and/or decommissioning must demonstrate accordance with SEPA Guidance on the life extension and decommissioning of onshore wind farms. Table 1 of the guidance provides a hierarchical framework of environmental impact based upon the principles of sustainable resource use, effective mitigation of environmental risk (including climate change) and optimisation of long term ecological restoration. The submission must demonstrate how the hierarchy of environmental impact has been applied, within the context of latest knowledge and best practice, including justification for not selecting lower impact options when life extension is not proposed.

2. The submission needs to state that there will be no discarding of materials that are likely to be classified as waste as any such proposals would be unacceptable under waste management licensing. Further guidance on this may be found in the document Is it waste - Understanding the definition of waste

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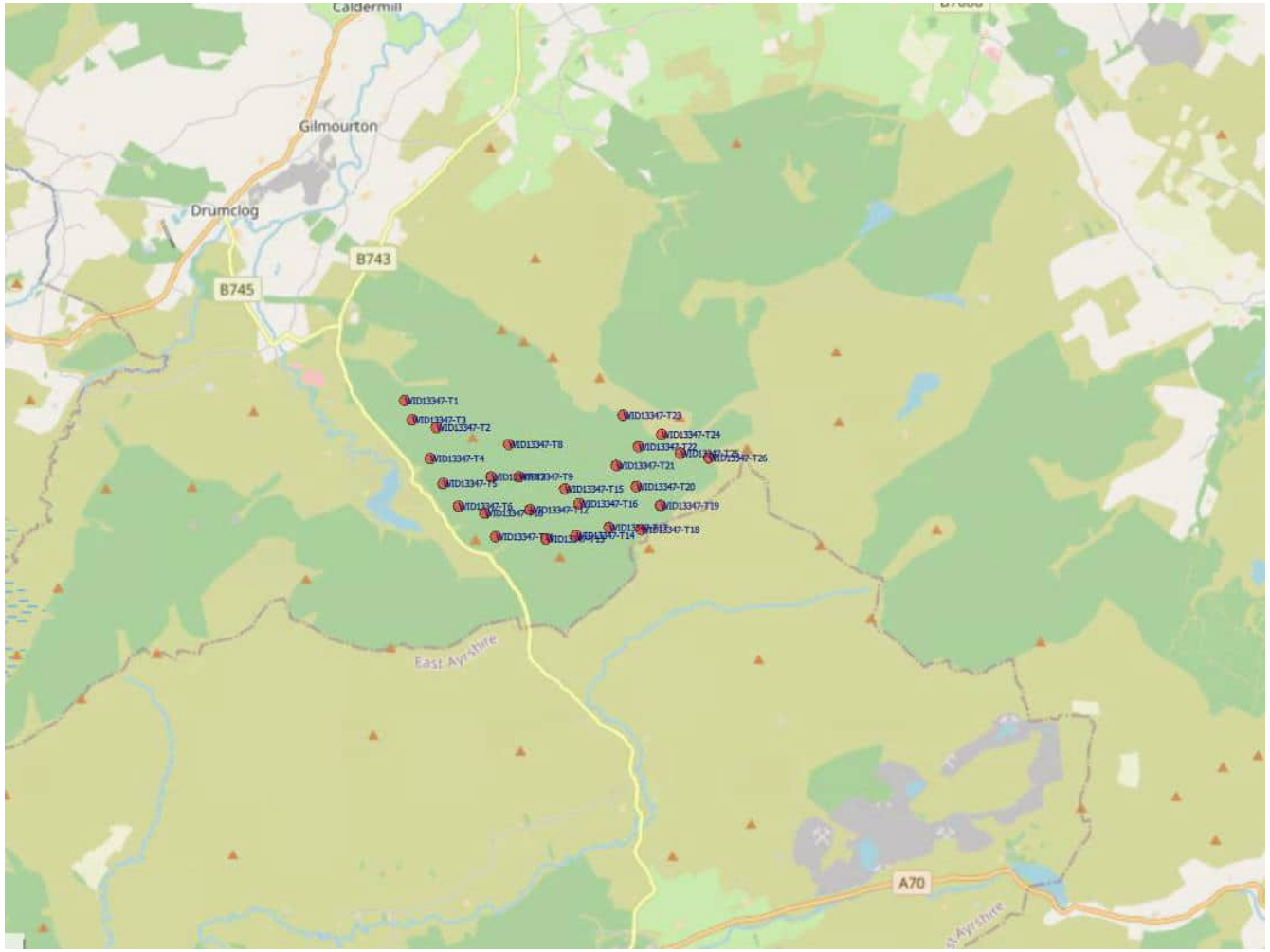
OUR REF:- WID13347

We have studied the proposed windfarm development with respect to EMC and related problems to BT point-to-point microwave radio links.

The conclusion is that the Project indicated should not cause interference to BT’s current and presently planned radio network.



A62

Defence Infrastructure Organisation

Stefany Alves Veronese
Assistant Safeguarding Manager
Ministry of Defence
Safeguarding Department
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DMS Whittington
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Telephone [MOD]: 07977 726 851

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Your Reference: ECU00004623

Our Reference: DIO 10056498

Nicola Ferguson
Case Officer
Energy Consents Unit
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

5 March 2024

By email only

Dear Nicola,

Application Reference:	ECU00004623
Site Name:	Hagshaw Energy Cluster Western Expansion
Proposal:	The proposed Development has been amended to up to 26 wind turbines with a blade to tip height of 230m, and associated infrastructure, within South Lanarkshire and the solar, BESS and substation development area located in East Ayrshire.
Site Address:	Approximately 2.45 km to the north of Muirkirk.

Thank you for consulting the Ministry of Defence (MOD) in relation to the scoping opinion with amended information, through your communication 21 February 2024.

The Defence Infrastructure Organisation (DIO) Safeguarding Team represents the MOD as a consultee in UK planning and energy consenting systems to ensure that development does not compromise or degrade the operation of defence sites such as aerodromes, explosives storage sites, air weapon ranges, and technical sites or training resources such as the Military Low Flying System.

I am writing to advise you that the MOD has concerns with the proposal.

The proposal concerns a development of 26 turbines with maximum blade tip heights of 230 metres above ground level. The proposed development has been assessed using the location data (Grid References) below provided in Scoping Update Report dated February 2024.

Turbine no.	Easting	Northing	Turbine no.	Easting	Northing
1	266560	635973	14	269042	633900
2	267021	635562	15	268896	634595
3	266666	635685	16	269100	634371
4	266914	635104	17	269536	634006
5	267094	634729	18	270005	633960

6	267313	634386	19	270306	634307
7	267811	634805	20	269957	634598
8	268083	635279	21	269668	634918
9	268223	634795	22	270005	635186
10	267695	634272	23	269791	635657
11	267848	633917	24	270354	635359
12	268369	634301	25	270626	635071
13	268595	633863	26	271042	634990

The principal safeguarding concerns of the MOD with respect to this development of wind turbines relates to their potential to create a physical obstruction to air traffic movements.

Physical Obstruction

In this case the development falls within Tactical Training Area 20T (TTA 20T), an area within which fixed wing aircraft may operate as low as 100 feet or 30.5 metres above ground level to conduct low level flight training. The addition of turbines in this location has the potential to introduce a physical obstruction to low flying aircraft operating in the area.

To address this impact, and given the location and scale of the development, the MOD require conditions are added to any consent issued requiring that the development is fitted with aviation safety lighting and that sufficient data is submitted to ensure that structures can be accurately charted to allow deconfliction.

As a minimum the MOD would require that the development be fitted with MOD accredited aviation safety lighting in accordance with the Air Navigation Order 2016. It is likely that the CAA specified lighting will exceed that required by the MOD but to ensure the safeguarding of any low flying/rotary military aircraft, the MOD would request the wind farm is lit with no less than 25cd visible or infra-red (IR) lighting on perimeter turbines.

Summary

The MOD has concerns with this proposal for the following reasons:

- The potential to create a physical obstruction to air traffic movements.

The MOD must emphasise that the advice provided within this letter is in response to the information detailed in the developer's document titled 'Scoping Update Report' and 'Proposed Development Layout' dated February 2024. Any variation of the parameters (which include the location, dimensions, form, and finishing materials) detailed may significantly alter how the development relates to MOD safeguarding requirements and cause adverse impacts to safeguarded defence assets or capabilities. In the event that any amendment, whether considered material or not by the determining authority, is submitted for approval, the MOD should be consulted and provided with adequate time to carry out assessments and provide a formal response.

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

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

MOD: https://www.gov.uk/government/publications/wind-farms-ministry-of-defence-safeguarding

Yours sincerely,

REDACTED

Stefany Alves Veronese
Assistant Safeguarding Manager
DIO Safeguarding

A64

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7 March 2024

Nicola Ferguson
Energy Consents Unit
The Scottish Government
By email

Dear Nicola

Your Ref: **ECU00004623**
Development: **Hagshaw Energy Cluster – Western Expansion**
Our Ref: **EDI3631**

This proposal has been examined from an aerodrome safeguarding perspective and conflicts with safeguarding criteria.

We therefore object to the development on the following grounds:

Instrument Flight Procedure (IFP) Assessment

No turbine tower of any turbine may be erected, unless and until such time as the Scottish Ministers receive confirmation from the Airport Operator in writing that: (a) an IFP Assessment has demonstrated that an IFP Scheme is not required; or (b) if an IFP Scheme is required such a scheme has been approved by the Airport Operator; and (c) if an IFP Scheme is required the Civil Aviation Authority has evidenced its approval to the Airport Operator of the IFP Scheme (if such approval is required); and (d) if an IFP Scheme is required the scheme is accepted by NATS AIS for implementation through the AIRAC Cycle (or any successor publication) (where applicable) and is available for use by aircraft.

Reason: In the interests of aviation safety.

Definitions:

"IFP Scheme" means a scheme to address the potential impact of the turbines on the instrument flight procedures of Edinburgh Airport.

"IFP Assessment" means a safeguarding assessment against current and any possible future IFPs. This assessment must be undertaken by a UK CAA Approved Procedure Design Organisation (APDO).

Further information on IFP Safeguarding and a quote for this assessment can be obtained by contacting safeguarding@edinburghairport.com.

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Where a Planning Authority proposes to grant permission against the advice of Edinburgh Airport, it shall notify Edinburgh Airport, the Civil Aviation Authority and the Scottish Ministers as specified in the Safeguarding of Aerodromes Direction 2003.

Yours sincerely

REDACTED

Claire Brown
Edinburgh Airport Limited
safeguarding@edinburghairport.com

A66

From:	Brian Davidson
To:	Nicola Ferguson
Cc:	Stuart Brabbs (stuart@ayrshireriverstrust.org); iain Clark (Doon DSFB) (iclark@gilsongray.co.uk); REDACTED
Subject:	RE: REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION
Date:	07 March 2024 15:35:57
Attachments:	image001.png

Dear Nicola,

Thank you for your correspondence concerning the proposed Hagshaw Energy Cluster near Muirkirk.

Fisheries Management Scotland (FMS) represents the network of 40 Scottish District Salmon Fishery Boards (DSFBs) including the River Tweed Commission (RTC), who have a statutory responsibility to protect and improve salmon and sea trout fisheries and the 26 fishery trusts who provide a research, educational and monitoring role for all freshwater fish.

FMS act as a convenient central point for Scottish Government and developers to seek views on local developments. However, as we do not have the appropriate local knowledge, or the technical expertise to respond to specific projects, we are only able to provide a general response with regard to the potential risk of such developments to fish, their habitats and any dependent fisheries. Accordingly, our remit is confined mainly to alerting the relevant local DSFB/Trust to any proposal.

The proposed development falls within the district of the Ayr District Salmon Fishery Board, and the catchment relating to the Ayrshire Rivers Trust and Clyde River Foundation. It is important that the proposals are conducted in full consultation with these organisations (see link to FMS member DSFBs and Trusts below). We have also copied this response to these organisations.

Due to the potential for such developments to impact on migratory fish species and the fisheries they support, FMS have developed, in conjunction with Marine Scotland Science, advice for DSFBs and Trusts in dealing with planning applications. We would strongly recommend that these guidelines are fully considered throughout the planning, construction and monitoring phases of the proposed development.

- LINK TO ADVICE ON TERRESTRIAL WINDFARMS
- LINK TO FMS MEMBER NETWORK CONTACT DETAILS

Kind regards,

Brian

Brian Davidson | Dir Communications & Administration
Fisheries Management Scotland
11 Rutland Square, Edinburgh, EH1 2AS
Tel: 0131 221 6567 | 075844 84602
www.fms.scot

A67

FAO Nicola Ferguson
Energy Consents Unit

11th March 2024

Dear Nicola

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION
Our reference: GLA4454

I refer to your request for scoping opinion received in this office on 21st February 2024.

The scoping report submitted has been examined from an aerodrome safeguarding perspective and we would make the following observations:

- The site is outwith the obstacle limitation surfaces for Glasgow Airport;
- It is within the radar safeguarding area and will likely require technical mitiation;
- It is within the instrument flight procedures safeguarding area and will likely impact. Detailed assessments will be required and we would encourage the applicant to engage with us on this as early as possible.

Our position with regard to this proposal will only be confirmed once the turbine details are finalized and we have been consulted on a full planning application. At that time we will carry out a full safeguarding impact assessment and will consider our position in light of, inter alia, operational impact and cumulative effects.

Yours sincerely
REDACTED

Kirsteen MacDonald
Safeguarding Manager
Glasgow Airport
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Kirsteen.MacDonald@agsairports.co.uk

By email only

The Scottish Government
Energy Consents Unit
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

FAO Nicola Ferguson

12 March 2024

Dear Nicola

Glasgow Prestwick Airport

ELECTRICITY ACT 1989
THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER WESTERN EXPANSION.

Glasgow Prestwick Airport Ltd ("the Airport") has reviewed the Scoping Consultation documents available on the Energy Consents Unit planning portal for the updated Hagshaw Energy Cluster Western Expansion (**ECU00004623**) and respond to the scoping consultation on aviation matters only.

The Airport's Windfarm Safeguarding Assessment Process

1. In aviation, safety in the air is paramount. That being the case, the Airport has considered the proposal in line with its Windfarm Safeguarding Assessment Process. The steps of that process are to be undertaken to ensure that the Airport meets the requirements imposed upon it through the Civil Aviation Publications (CAPs) which are promulgated by the Airport's regulator, the Civil Aviation

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Authority (CAA).

The safeguarding assessment process has identified potential adverse effects on the Airport's primary surveillance radar, Instrument Flight Procedures (IFPs) and VHF Communication Equipment. Those issues having been identified; the Airport conducted an Air Traffic Control (ATC) Operational Impact Assessment which is provided for in its Windfarm Safeguarding Assessment Process.

The Airport's ATC Operational Impact Assessment

2. The ATC Operational Assessment indicates that the proposed development lies outwith Glasgow Prestwick Airport's Controlled Airspace (CAS) and is in an area where the Airport's ATC provide an air traffic service on a less frequent basis. However, if any of the turbines are confirmed visible to the Airport's primary surveillance radar then mitigation would still be required.

3. Other issues raised in the ATC Operational Impact Assessment included:

   i. the need for aviation lighting for obstacles above 150m in height;

   ii. potential loss of VHF Ground to Air communications in the vicinity of the windfarm as a consequence of the large turbines.

   iii. The potential for a full Airspace Change Process regarding changes to the Terminal Arrival Altitude, with a possible requirement to alter the heights of the RNP 21 Procedure.

Primary Surveillance Radar (PSR)

4. Preliminary Radar Line of Sight ("RLoS") analysis at the maximum turbine tip heights of 230m for the proposed Hagshaw energy Cluster Western Expansion indicates that there is a high likelihood that all of the proposed turbines will be visible to the Airport's primary radar(s). Further assessments will therefore be required to establish and confirm the actual number of turbines which will be visible to the Airport's primary radar(s).

Turbines visible to the Airport's primary radar(s) cause turbine clutter on the Airport's radar controllers display(s). They may also cause other degradative effects on the airspace above and in

the vicinity of the turbines (e.g. shadowing, loss of base radar cover, etc).

With regard to the clutter on the Airport ATC radar controllers display(s), the Airport's Terma Scanter 4002 radar ("Terma") contains software which provides the potential for Terma to be optimised to mitigate the clutter. However, mitigation is not an automatic process nor is it guaranteed to work. In line with the Airport's Windfarm Safeguarding Assessment Process, it will be necessary to conduct baseline flight trials and radar modelling assessments to assess the anticipated Probability of Detection ("PD") in the airspace above the turbines post windfarm construction and post optimisation of Terma.

The anticipated PD will of course have to be acceptable from an aviation safety perspective. Although it is possible to estimate the PD following optimisation of Terma, the results are not guaranteed. The actual PD which is achieved after optimisation will have to be confirmed by a post construction flight trial with support from Terma engineers.

Assuming that an acceptable, and confirmed, PD is achieved post optimisation, the mitigation will have to be kept in place by the Airport for the lifetime of the windfarm. There will be costs and risks for the Airport in that process.

Instrument Flight Procedures (IFPs)

5. The developer is fully engaged with the airport with the original IFP assessment identifying issues with the Air Traffic Control Safety Minimum Altitude Chart (ATCSMAC) and Minimum Safety Altitude (MSA) and the Terminal Arrival Altitude (TAA) associated with satellite based navigational procedures in the vicinity of the development due to the height of the turbines (230m). An updated and expanded assessment is required to explore the technical feasibility of a change to these levels, after which a further operational impact assessment (involving dialogue with our aviation customers and ATC units with whom the airspace is adjacent to) would be conducted. The Operational Impact Assessment has indicated that a change to the ATCSMAC would be required.

6. Further discussions are required with the Developer and our Approved Procedure Design Organisation (APDO) as to whether potential changes to TAA levels would be technically feasible and operationally acceptable (or otherwise), and also the extent of airspace change that may be

required to implement any operational changes (if deemed acceptable). Should a redesign that is both technically feasible and operationally acceptable to the Airport be possible, this may result in an airspace change procedure (ACP) under the auspices of CAP1616. A full ACP is a lengthy and expensive process, the costs of which will need to be borne by the Developer, with no guarantee of ultimate approval by the CAA.

7. **It should also be noted that technical feasibility does not imply or necessitate operational acceptability on the part of the Airport.**

Technical Safeguarding – VHF Communication Equipment(s)

8. Preliminary analysis indicates it will be necessary to conduct a detailed Technical Safeguarding Assessment in respect of the protection of the Airport's VHF Radio Navigation Equipment in accordance with *CAP670 - Part B, Section 4: GEN 02: Technical Safeguarding of Aeronautical Radio Stations Situated at UK Aerodromes and Appendix A to GEN 02: Methodology for the Prediction of Wind Turbine Interference Impact on Aeronautical Radio Station Infrastructure*.

Aviation Lighting

9. The Airport is interested as to how the Developer intends to address the aviation warning obstruction lighting as required by UK CAA for obstacles greater than 150m in height above local ground level in accordance with Article 222 of the UK Air Navigation Order (ANO) 2016. While solely a matter for the CAA to consider, should the final aviation lighting scheme consider the use of Aircraft Detection Lighting System (ADLS) dependent upon Electronic Conspicuity (EC) Equipment and be part of any proposed lighting scheme, GPA respectfully request that they are consulted with further.

Cumulative Impact

10. The Airport also raises concerns in respect of the cumulative impact, due to other proposed windfarms in the vicinity of the proposed Hagshaw Energy Cluster Western Expansion. Those risks include: (1) Terma not being able to provide the required level of mitigation; and (2) adverse impact on VHF Communication Equipment(s). The cumulative issues across the whole coverage volume are likely to result in the Airport having to procure and install (at the appropriate point) additional surveillance and communication equipment to address the cumulative impact of multiple windfarms in close

proximity to each other.

Hagshaw Energy Cluster Western Expansion - further Safeguarding Work required

11. The Airport request that any proposed Aviation Impact Assessment considers the issues raised in this response letter, namely:

    i. A detailed Radar Line of Sight analysis against the Airport's primary surveillance radar(s);

    ii. An updated and expanded IFP assessment to re-evaluate the new turbine positions and heights, and to explore the technical feasibility of any proposed changes, after which a further operational impact assessment would be conducted by the Airport.

    iii. A VHF radio communication assessment in the vicinity of the proposed windfarm against the Airport's VHF Ground to Air radio equipment(s) infrastructure.

    iv. Full details of the proposed Aviation lighting scheme.

Conclusions

12. The development raises aviation safety concerns which have the potential to have an operational impact on the Airport as an Air Navigation Services Provider (ANSP). The Airport has engaged in early dialogue and engagement with the Developer to address the issues which have arisen and are detailed in this response. As part of that engagement, the Airport is working through its full ATC Operational Impact Assessment and the Technical Safeguarding Assessment(s) to consider the various impacts of the proposal and how they are to be addressed. As part of that dialogue, the Airport would wish to discuss the terms of a suitable mitigation agreement to address the demonstrable cost and risks which will be imposed upon it as a result of the proposed development.

13. Should this proposal become a full Section 36 planning application, the Airport would be minded to object to the proposed development until all technical and operational aviation safety matters detailed above are addressed to the satisfaction of the Airport, and a mitigation agreement is put in place for the life of the windfarm.

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14. The Airport continues to be fully engaged with the Developer and is already several steps into the process of attempting to resolve the aviation safety issues discussed above.

Yours faithfully

REDACTED

Ian Hutchinson

Aerodrome Safeguarding Manager

For and on behalf of Glasgow Prestwick Airport Limited

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A74

From: JRC Windfarm Coordinations Old
To: Nicola Ferguson
Subject: HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION [WF579753]
Date: 11 March 2024 11:57:19

Dear nicola,

A Windfarms Team member has replied to your co-ordination request, reference **WF579753** with the following response:

If any details of this proposal change, particularly the disposition or scale of any turbine(s), this clearance will be void and re-evaluation of the proposal will be necessary.

Please do not reply to this email - the responses are not monitored.
If you need us to investigate further, then please use the link at the end of this response or login to your account for access to your co-ordination requests and responses.

Dear Nicola,

***Site Name**: Hagshaw Energy Cluster – Western Expansion*

***Turbine(s) at NGR**:*

Turbine No.	*X Coordinate*	*Y Coordinate*	*Tip Height (m)*	*Rotor Diameter (m)*
01	*266560*	*635973*	*230*	*163*
02	*267021*	*635562*	*230*	*163*
03	*266666*	*635685*	*230*	*163*
04	*266914*	*635104*	*230*	*163*
05	*267094*	*634729*	*230*	*163*
06	*267313*	*634386*	*230*	*163*
07	*267811*	*634805*	*230*	*163*
08	*268083*	*635279*	*230*	*163*
09	*268223*	*634795*	*230*	*163*
10	*267695*	*634272*	*230*	*163*
11	*267848*	*633917*	*230*	*163*
12	*268369*	*634301*	*230*	*163*
13	*268595*	*633863*	*230*	*163*
14	*269042*	*633900*	*230*	*163*
15	*268896*	*634595*	*230*	*163*
16	*269100*	*634371*	*230*	*163*
17	*269536*	*634006*	*230*	*163*
18	*270005*	*633960*	*230*	*163*
19	*270306*	*634307*	*230*	*163*
20	*269957*	*634598*	*230*	*163*
21	*269668*	*634918*	*230*	*163*
22	*270005*	*635186*	*230*	*163*
23	*269791*	*635657*	*230*	*163*
24	*270354*	*635359*	*230*	*163*
25	*270626*	*635071*	*230*	*163*

26 271042 634990 230 163

***Max Hub Height (calc.)**: 149.5m* ***Max Rotor Radius**: 81.5m*

*This proposal is ***cleared*** with respect to radio link infrastructure operated by the local energy networks.*

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

In the case of this proposed wind energy development, JRC does not foresee any potential problems based on known interference scenarios and the data you have provided. However, if any details of the wind farm change, particularly the disposition or scale of any turbine(s), it will be necessary to re-evaluate the proposal. Please note that due to the large number of adjacent radio links in this vicinity, which have been taken into account, clearance is given specifically for a location within the declared grid reference (quoted above).

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

It should be noted that this clearance pertains only to the date of its issue. As the use of the spectrum is dynamic, the use of the band is changing on an ongoing basis and consequently, you are advised to seek re-coordination prior to submitting a planning application, as this will negate the possibility of an objection being raised at that time as a consequence of any links assigned between your enquiry and the finalisation of your project.

JRC offers a range of radio planning and analysis services. If you require any assistance, please contact us by phone or email.

Regards

Wind Farm Team

Friars House
Manor House Drive
Coventry CV1 2TE
United Kingdom

Office: 02476 932 185

you. If you would like to be removed, please contact anita.lad@jrc.co.uk.

We hope this response has sufficiently answered your query.
If not, please **do not send another email** as you will go back to the end of the mail queue, which is not what you or we need. Instead, **reply to this email by clicking on the link below or login to your account** for access to your co-ordination requests and responses.

https://breeze.jrc.co.uk/tickets/view.php?auth=o1xxufqaacyp2aaa%2FFXU9M9cI3ko%2BQ%3D%3D

A77

HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION
SCOPING REPORT

I write on behalf of Muirkirk Community Council and confirm that in our opinion the amended scoping report is comprehensive, and covers all aspects of the environmental impact of the proposed wind farm including the S.P.A. Whilst there may be extra volume of traffic associated with the proposal we do not envisage this will have any material impact.
Given the foregoing we have no negative comments and if the wind farm, together with solar panels and battery storage were to proceed it will result in a positive result for environment and the community at large.

Regards
David McLatchie
Chairman Muirkirk Community Council

From:	NATS Safeguarding
To:	Nicola Ferguson
Cc:	Econsents Admin
Subject:	RE: REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION [SG34117]
Date:	27 February 2024 09:58:48
Attachments:	image002.png image003.png image004.png image005.png image006.png image007.png image008.png SG34117 Hagshaw Energy Cluster - Western Expansion - TOPA Issue 2.pdf

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Our Ref: SG34117

Dear Sir/Madam

We refer to the application above. The proposed development has been examined by our technical safeguarding teams and conflicts with our safeguarding criteria.

Accordingly, NATS (En Route) plc objects to the proposal. The reasons for NATS's objection are outlined in the attached report TOPA SG34117.

We would like to take this opportunity to draw your attention to the legal obligation of local authorities to consult NATS before granting planning permission. The obligation to consult arises in respect of certain applications that would affect a technical site operated by or on behalf of NATS (such sites being identified by safeguarding plans that are issued to local planning authorities).

In the event that any recommendations made by NATS are not accepted, local authorities are obliged to follow the relevant directions within Planning Circular 2 2003 - Scottish Planning Series: Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) (Scotland) Direction 2003 or Annex 1 - The Town And Country Planning (Safeguarded Aerodromes, Technical Sites And Military Explosives Storage Areas) Direction 2002.

These directions require that the planning authority notify both NATS and the Civil Aviation Authority ("CAA") of their intention. As this further notification is intended to allow the CAA to consider whether further scrutiny is required, the notification should be provided prior to any granting of permission.

It should also be noted that the failure to consult NATS, or to take into account NATS's comments when determining a planning application, could cause serious safety risks for air traffic.

Should you have any queries, please contact us using the details below.

Yours faithfully

NATS

NATS Safeguarding
E: natssafeguarding@nats.co.uk
4000 Parkway, Whiteley,
Fareham, Hants PO15 7FL
www.nats.co.uk

Prepared by:
NATS Safeguarding Office

Technical and Operational Assessment (TOPA)

For Hagshaw Energy Cluster – Western Expansion Wind Farm Development

NATS ref: SG34117

Scottish Government ref: ECU00004623

Issue 2

Contents

Publication History

Issue	Month/Year	Change Requests and summary
1	October 2022	Scoping Request
2	February 2024	Scoping Request

Document Use

External use: Yes

Referenced Documents

1. Background

1.1. En-route Consultation

NATS en-route plc is responsible for the safe and expeditious movement in the en-route phase of flight for aircraft operating in controlled airspace in the UK. To undertake this responsibility it has a comprehensive infrastructure of RADAR's, communication systems and navigational aids throughout the UK, all of which could be compromised by the establishment of a wind farm.

In this respect NATS is responsible for safeguarding this infrastructure to ensure its integrity to provide the required services to Air Traffic Control (ATC).

In order to discharge this responsibility NATS is a statutory consultee for all wind farm applications, and as such assesses the potential impact of every proposed development in the UK.

The technical assessment sections of this document define the assessments carried out against the development proposed in section 3.

2. Scope

This report provides NATS En-Route plc's view on the proposed application in respect of the impact upon its own operations and in respect of the application details contained within this report.

Where an impact is also anticipated on users of a shared asset (e.g. a NATS RADAR used by airports or other customers), additional relevant information may be included for information only. While an endeavour is made to give an insight in respect of any impact on other aviation stakeholders, it should be noted that this is outside of NATS' statutory obligations and that any engagement in respect of planning objections or mitigation should be had with the relevant stakeholder, although NATS as the asset owner may assist where possible.

3. Application Details

Scottish Government submitted a request for a NATS technical and operational assessment (TOPA) for the development at Hagshaw Hill Energy Cluster – Western Expansion Wind Farm. It will comprise turbines as detailed in Table 1 and contained within an area as shown in the diagrams contained in Appendix B.

Turbine	Lat	Long	East	North	Tip Height (m)
1	55.5990	-4.1194	266560	635973	230
2	55.5955	-4.1119	267021	635562	230
3	55.5965	-4.1175	266666	635685	230
4	55.5913	-4.1133	266914	635104	230
5	55.5880	-4.1103	267094	634729	230
6	55.5850	-4.1067	267313	634386	230
7	55.5889	-4.0990	267811	634805	230
8	55.5932	-4.0949	268083	635279	230
9	55.5889	-4.0924	268223	634795	230
10	55.5841	-4.1005	267695	634272	230
11	55.5809	-4.0980	267848	633917	230
12	55.5845	-4.0899	268369	634301	230
13	55.5806	-4.0861	268595	633863	230
14	55.5811	-4.0790	269042	633900	230
15	55.5873	-4.0817	268896	634595	230
16	55.5853	-4.0783	269100	634371	230
17	55.5822	-4.0712	269536	634006	230
18	55.5819	-4.0638	270005	633960	230
19	55.5851	-4.0592	270306	634307	230
20	55.5876	-4.0648	269957	634598	230
21	55.5904	-4.0696	269668	634918	230
22	55.5929	-4.0644	270005	635186	230
23	55.5971	-4.0680	269791	635657	230
24	55.5945	-4.0589	270354	635359	230
25	55.5920	-4.0545	270626	635071	230
26	55.5914	-4.0478	271042	634990	230

Table 1 – Turbine Details

4. Assessments Required

The proposed development falls within the assessment area of the following systems:

En-route Surv	Lat	Long	nm	km	Az (deg)	Type
Great Dun Fell Radar	54.6841	-2.4509	77.4	143.4	314.7	CMB
Lowther Hill Radar	55.3778	-3.7530	16.2	30.0	318.4	CMB
Perwinnes Radar	57.2123	-2.1309	116.5	215.8	214.5	CMB
Tiree Radar	56.4556	-6.9230	107.5	199.1	117.4	CMB
En-route Nav	**Lat**	**Long**	**nm**	**km**	**Az (deg)**	**Type**
None						
En-route AGA	**Lat**	**Long**	**nm**	**km**	**Az (deg)**	**Type**
None						

Table 2 – Impacted Infrastructure

4.1. En-route RADAR Technical Assessment

4.1.1. Predicted Impact on Lowther RADAR

Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated.

4.1.2. Predicted Impact on Cumbernauld RADAR

Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated.

4.1.3. Predicted Impact on Glasgow RADAR

Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal over the eastern portion of the development, and therefore this part of the development is likely to cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated.

4.1.4. En-route operational assessment of RADAR impact

Where an assessment reveals a technical impact on a specific NATS' RADAR, the users of that RADAR are consulted to ascertain whether the anticipated impact is acceptable to their operations or not.

Unit or role	Comment
Prestwick Centre ATC	Unacceptable
Military ATC	Acceptable

Note: The technical impact, as detailed above, has also been passed to non-NATS users of the affected RADAR, this may have included other planning consultees such as the MOD or other airports. Should these users consider the impact to be unacceptable it is expected that they will contact the planning authority directly to raise their concerns.

4.2. En-route Navigational Aid Assessment

4.2.1. Predicted Impact on Navigation Aids

No impact is anticipated on NATS' navigation aids.

4.3. En-route Radio Communication Assessment

4.3.1. Predicted Impact on the Radio Communications Infrastructure

No impact is anticipated on NATS' radio communications infrastructure.

5. Conclusions

5.1. En-route Consultation

The proposed development has been examined by technical and operational safeguarding teams. A technical impact is anticipated, this has been deemed to be unacceptable.

Appendix A – Background RADAR Theory

Primary RADAR False Plots

When RADAR transmits a pulse of energy with a power of P_t the power density, P, at a range of r is given by the equation:

$$P = \frac{G_t P_t}{4\pi r^2}$$

Where G_t is the gain of the RADAR's antenna in the direction in question.

If an object at this point in space has a RADAR cross section of σ, this can be treated as if the object re-radiates the pulse with a gain of σ and therefore the power density of the reflected signal at the RADAR is given by the equation:

$$P_a = \frac{\sigma P}{4\pi r^2} = \frac{\sigma G_t P_t}{(4\pi)^2 r^4}$$

The RADAR's ability to collect this power and feed it to its receiver is a function of its antenna's effective area, A_e, and is given by the equation:

$$P_r = P_a A_e = \frac{P_a G_r \lambda^2}{4\pi} = \frac{\sigma G_t G_r \lambda^2 P_t}{(4\pi)^3 r^4}$$

Where G_t is the RADAR antenna's receive gain in the direction of the object and λ is the RADAR's wavelength.

In a real world environment this equation must be augmented to include losses due to a variety of factors both internal to the RADAR system as well as external losses due to terrain and atmospheric absorption.

For simplicity these losses are generally combined in a single variable L

$$P_r = \frac{\sigma G_t G_r \lambda^2 P_t}{(4\pi)^3 r^4 L}$$

Secondary RADAR Reflections

When modelling the impact on SSR the probability that an indirect signal reflected from a wind turbine has the signal strength to be confused for a real interrogation or reply can determined from a similar equation:

$$P_r = \frac{\sigma G_t G_r \lambda^2 P_t}{(4\pi)^3 r_t^2 r_r^2 L}$$

Where r_t and r_r are the range from RADAR-to-turbine and turbine-to-aircraft respectively. This equation can be rearranged to give the radius from the turbine within which an aircraft must be for reflections to become a problem.

$$r_r = \sqrt{\frac{\lambda^2}{(4\pi)^3}} \sqrt{\frac{\sigma G_t G_r P_t}{r_t^2 P_r L}}$$

Shadowing

When turbines lie directly between a RADAR and an aircraft not only do they have the potential to absorb or deflect, enough power such that the signal is of insufficient level to be detected on arrival.

It is also possible that azimuth determination, whether this done via sliding window or monopulse, can be distorted giving rise to inaccurate position reporting.

Terrain and Propagation Modelling

All terrain and propagation modelling is carried out by a software tool called ICS Telecom (version 11.1.7). All calculations of propagation losses are carried out with ICS Telecom configured to use the ITU-R 526 propagation model.

Appendix B – Diagrams

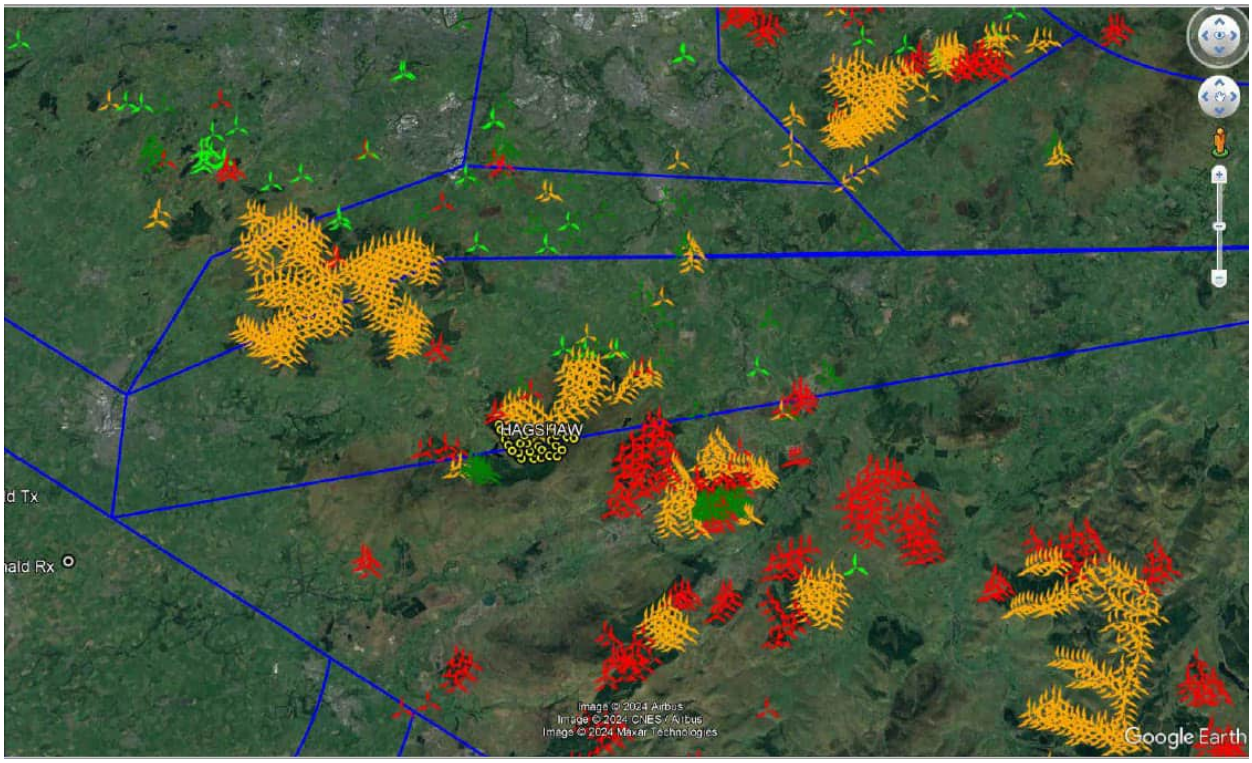

Figure 1: Proposed development location shown on an airways chart

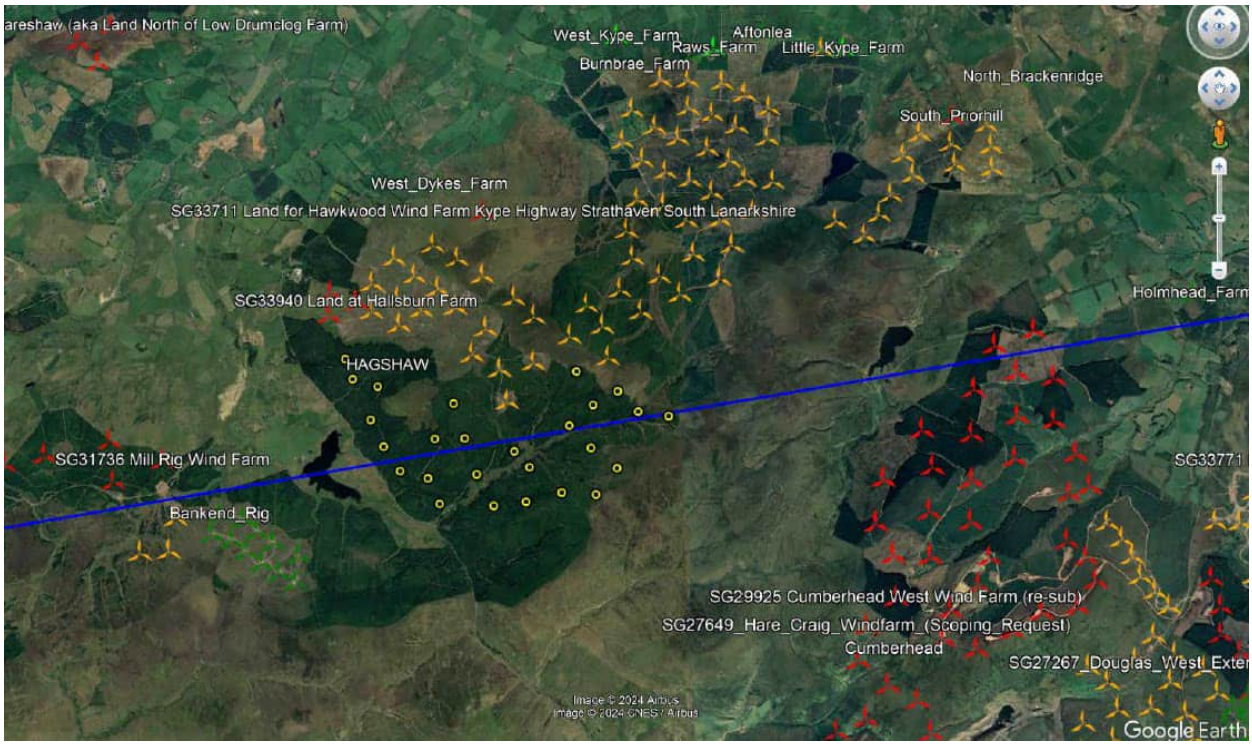

Figure 2: Proposed development shown alongside other recently assessed applications

consented/built | impact –accepted | impact –objection | mitigated
mitigation –proposed | no impact | refused/withdrawn

From:	Brian Eardley
To:	Nicola Ferguson; Matthew Bird
Subject:	RE: REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION
Date:	25 March 2024 11:55:20
Attachments:	image002.png image003.png

Hello Nicola

Thanks you for the opportunity of commenting on the Environmental Impact Assessment (EIA) Scoping report for the proposed western extension of the Hagshaw Energy Cluster, and for granting an extension to get comments back to you. The following comments refer to Chapter 6. Ecology and Nature Conservation and Chapter 7. Ornithology, as these are directly relevant to Biodiversity Unit interests.

Having reviewed both Chapters 6 and 7, I am content that the scope of the proposed study to inform the EIA is appropriate, as are the suggested survey methodologies for the different species groups associated with this site.

As the Scoping report notes, part of the proposed development site overlaps with the Muirkirk and North Lowther Uplands Special Protection Area (SPA), so in addition to the requirements for an EIA, a Habitats Regulations Appraisal (HRA) will also be required. Whilst the evidence required to undertake the EIA and HRA is likely to be the same, they have different purposes, so will need to be treated separately when evaluating this proposal. I am concerned that HRA process outlined in the Scoping report is not an accurate description of the process which is required. The basis for the HRA should be the Conservation Objectives for the site – these can be found on NatureScot's Sitelink website - here. In carrying out a HRA, the Competent Authority must first establish whether the plan or project is connected or necessary to site management for nature conservation and if it is not to determine whether there is likely be a significant effect on the site (disregarding any proposed mitigation) – based on the Conservation Objectives for the sire. If a likely significant effect is concluded, then the Competent Authority must carry out an appropriate assessment to determine whether the proposal will have an adverse impact on integrity. The full process, and associated guidance can be found on NatureScot's website – here.

I hope these comments are helpful – please do not hesitate to get back to me if you have any questions on any of the above.

Take care

REDACTED

Brian Eardley Biodiversity Team Policy Manager Nature Division Scottish Government
He/his *Why have I put this?*

A90

Kirstin Keyes
Case Manager
Energy Consents Unit
The Scottish Government
Sent by email: Kirstin.Keyes@gov.scot; Nicola.Ferguson@gov.scot

3rd May 2024

Dear Kirstin,

ELECTRICITY ACT 1989
THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION (PHASE 1)

Thank you for consulting RSPB Scotland on the Scoping Opinion request for the above-named proposal (ECU reference: ECU00004623), and for allowing us additional time to provide comments.

RSPB Scotland is supportive of the use of renewable energy due to the urgent need to tackle climate change. However, we are also facing a nature emergency, with significant declines in the abundance and numbers of biodiversity[1]. The Scottish Government's Fourth National Planning Framework (NPF4) recognises that the climate and nature crises are intrinsically linked and emphasises the importance of planning in tackling these issues. RSPB Scotland believes that developments should leave nature in a better state than before and welcomes the requirement in Policy 3 of NPF4 that all developments deliver biodiversity enhancement.

Context
RSPB Scotland responded in November 2022 to a previous iteration of the above-named (*Hagshaw Energy Cluster - Western Expansion)* onshore wind proposal. Our response highlighted our significant concerns due to the location of proposed turbines largely **within** the Muirkirk and North Lowther Uplands Special Protection Area (SPA); the Scoping Report did not give sufficient attention to the issues of protected sites, or clearly

[1] NatureScot. 2023. State of Nature report shows Scotland's wildlife continues to decline. Available: https://www.nature.scot/state-nature-report-shows-scotlands-wildlife-continues-decline

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identify the requirement to undergo a Habitats Regulations Appraisal. In our view, based on the information provided in the scoping report, it would not have been possible to establish beyond reasonable scientific doubt that the proposal would not result in an adverse impact on SPA site integrity relating to the potential impact to the Muirkirk and North Lowther Uplands and Special Protected Area (MNLU SPA) and that it would therefore, not pass the test under the Habitats Directive.

The present proposal associated with the updated scoping report published in February 2024, is for an amended turbine layout (and other renewable infrastructure components, e.g. solar array and battery storage), which does **not** propose for infrastructure to be located within the SPA. We note reference at section 2.3.5 in the Scoping Report to a further proposal, known as Phase 2, which proposes wind turbines **within** the boundary of the SPA (as shown in Areas B and C of Figure 2.1 of the Scoping Report). As such, we emphasise that our comments in this response regard **Phase 1** and we do not make comments in relation to any future proposal to be located within the SPA at this time.

Designated Sites

Muirkirk and North Lowther Uplands Special Protection Area (SPA)

Muirkirk and North Lowther Upland SPA was designated in 2003 for breeding populations of Annex 1 species: Hen Harrier, Short-Eared Owl, Merlin, Peregrine, and Golden Plover; it is also designated for supporting wintering populations of Hen Harrier[2]. The SPA is also underpinned by the Muirkirk Uplands SSSI which is designated for nationally important upland habitats and bird assemblages[3] , and overlaps with the Airds Moss Special Area of Conservation (SAC) designated for blanket bog habitat[4] . Based on available information on NatureScot's SiteLink website, the Muirkirk and North Lowther Uplands SPA qualifying features are currently classed as being in the following conditions:

- Golden Plover, and breeding and non-breeding Hen Harrier: unfavourable declining.
- Merlin and Peregrine: unfavourable no change
- Short-Eared Owl: favourable maintained (*n.b. this feature was last assessed in 1998, therefore pre-designation as SPA*).

Habitats Regulations Appraisal

The proposed development is not directly connected with or necessary to the management of the SPA, and the proposal could have likely significant effects on the SPA. Therefore, the competent authority, Scottish Ministers, are required to carry out an Appropriate Assessment under regulation 63(1) of the Conservation of Habitats and Species Regulations 2017; and under Reg 63(2) the applicant is required to provide information to inform the Appropriate Assessment. The competent authority must then be able to establish beyond reasonable scientific doubt that there will be no adverse effect on the integrity of the SPA from the proposed wind farm, alone and in-combination with other plans and projects.

We therefore, agree with the statement in the Scoping Report that this proposal will need to undergo a HRA (section 7.2.9 of Scoping Report).

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[2] NatureScot. *Muirkirk and North Lowther Uplands SPA*. Available: https://sitelink.nature.scot/site/8616

[3] NatureScot. *Muirkirk Uplands SSSI*. Available: https://sitelink.nature.scot/site/8166

[4] NatureScot. *Airds Moss SAC*. Available: https://sitelink.nature.scot/site/8186

The applicant will need to provide sufficient information to inform the HRA process, to inform an Appropriate Assessment (AA) to be carried out by the competent authority in line with requirements under the Conservation of Habitats and Species Regulations 2017.

We highlight the requirement to assess the effect on the integrity of the whole SPA with regard to its qualifying features and conservation objectives and not just within the project boundary.

Environmental Impact Assessment (EIA)

Operational Effects

Section 7.6 of the Scoping Report and Table 7.2[5] (*Receptors and Impacts Scoped In and Out*) states that operational impacts through collision risk and disturbance/displacement will be assessed through the EIA. We recommend that this includes impacts through permanent operational displacement for all target species as well as temporary impacts through disturbance during construction.

Implications of the proposal for habitat management at adjacent operational wind farms

Section 7.2.1 in the Scoping Report describes the baseline for this proposal and confirms that the northern development area of the proposal is situated in commercial forestry. However, we are aware that the location of proposed turbines within this area will conflict with an area that has been subject to habitat management as part of a condition for consent of the operational Dungavel wind farm. Since this factor is not referenced in the Scoping Report, we assume that it has not been addressed through design considerations. We recommend that this issue is fully assessed as part of the EIA that is likly to include consideration for iterations to the infrastructure layout.

RSPB Scotland has a seat on the Habitat Management Group (HMG) for the Dungavel Wind Farm HMP, and we are therefore, aware that part of the origianl HMP area was designated to deliver enhancement for Hen Harriers. The most recent ecological report relating to the HMP (recieved in April 2024) concludes these original areas provide suitable habitat for ground-nesting raptors, increases the extent of suitable habitat close to the SPA, and this overall will reduce the likelihood of raptors nesting close to specified turbines within the operational Dungavel Wind Farm. However, having reviewed the proposed layout for Phase 1 of Hagshaw Energy Cluster - Western Expansion based on Figure 3.3 in the Scoping Report, we are concerned Turbines 12 and 15 are proposed to be sited within these areas of Hen Harrier enhancement. We do not think these are appropriate locations for turbines, given the role these areas play in delivering suitable nesting habitat for ground-nesting raptors, to mitigate impacts of an existing/consented wind farm as detailed in the most recent ecological report.

Survey work

Proposed survey methodology

Section 7.4.1 in the Scoping Report states use of a "robust contemporary ornithological baseline" for the ornithological impact assessment, and the HRA. In RSPB Scotland's response to Scoping in 2022, we raised serious concern about this approach, and uphold this concern in the context of the Phase 1 proposal in the context of the HRA process: the effect on the integrity of the **whole SPA** should be assessed with regard to its qualifying

[5] N.b. 'Table 7.2' appears twice in the Scoping report at page 27 and 30; here we are referring to the Table 7.2 on page 30.

features and conservation objectives and taking into account the **species populations at time of designation**.

Proposed survey areas

We consider that survey effort undertaken and ongoing will be at a sufficient scale to inform the EIA for the Phase 1 proposal. Figure 7.1 illustrates the survey area for breeding bird survey (BBS) undertaken across years 2021, 2022 and 2023, in part related to the former Scoping proposal for *Hagshaw Energy Cluster – Western Expansion,* a proposal which included infrastructure both within and oustide the SPA. Figure 7.2 sets out the proposed coverage for winter walk over survey effort which is stated as being up to 500m of the project boundary (section 7.4.15 of Scoping Report).

However, we note that the buffers for survey area associated with the proposed solar component of the Phase 1 proposal, located along the south-western boundary of the SPA, as it appears in Figures 7.1 and 7.2, is a reduced area of coverage for BBS and winter walkover surveys, respectively. NatureScot guidance[6] states that breeding and wintering bird survey areas should extend at least 500m beyond the development/planning application boundary, as potential collision risk, habitat loss and displacement could affect birds out with the proposal site**.** In addition, NatureScot pre-application and scoping advice for surveys relating to solar farm proposals advises that more than one year of survey effort may be required for sites that might impact on designated sites, including SPAs[7]. **Therefore, we recommend that the EIA includes reference to this in relation to assessment of impact to ornithology; this will ensure a robust assessment of potential impact of this project to ornithological species and qualifying species of the SPA can be made.**

Target ornithological species

Section 7.4.20 of the Scoping Report states Hen Harrier, Pergrine and Golden Plover are likely to be included in the EIA. However, the applicant needs to ensure they provide sufficient information to inform the HRA process, therefore we recommend that consideration is given to all qualifying species of the SPA in the EIA. This would align with the following conclusion made in the Scoping Report that any effects upon site integrity will be considered through the HRA process (Sections 7.4.21-22 in the Scoping Report).

Delivering mitigation measures and biodiversity enhancement

The Scoping Report references the need to consider mitigation measures during operation and to reduce impacts to an acceptable level (section 7.5 of Scoping Report). We recommend the applicant needs to consider impacts during **all** phases of development, including construction and decommissioning. These measures are proposed to be included in a Construction Environmental Management Plan (CEMP).

We recommend that management and intervention measures to deliver mitigation for impacts, compensation for losses, and positive effects for biodiversity need to be clearly set out to ensure that the mitigation hierarchy is followed, and that enhancement measures are **in addition** to mitigation and compensation, to ensure the applicant meets requirements under NPF4 Policy 3 (Biodiversity). Ultimately, it is essential that these measures are clearly defined, and we recommend setting these out in separate documentation if needed.

---

[6] SNH. 2017. Recommended bird survey methods to inform impact assessment of onshore wind farms

[7] NatureScot. 2022. *General pre-application and scoping advice for solar farms*. Available: https://www.nature.scot/doc/general-pre-application-and-scoping-advice-solar-farms#Birds

In addition, given the requirement in NPF4 Policy 3 to deliver biodiversity enhancement we recommend the Applicant ensures the feasibility of proposed enhancement activities in terms of land availability and land suitability for measures, to support target species; we recommend land availability and suitability are secured prior to consent, with inclusion of key information as outlined in NatureScot guidance[8] on habitat management plans (HMPs). We recommend outline HMP priorities and objectives are agreed pre-consent and approved with key stakeholders based on the interests in the area. We recommend any HMP, including biodiversity enhancement, is secured by planning condition, and that a Habitat Management Group is established to monitor and report on HMP actions/outcomes.

I hope these comments are helpful, and apologies for the delay in responding to the consultation. Please do not hesitate to contact me should further discussions be required regarding any part of our response.

Yours sincerely,

REDACTED

Julia Gallagher

Senior Conservation Officer – Scottish Lowlands & Southern Uplands

[8] NatureScot. 2016. *Planning and development: what to consider and include in Habitat Management Plans*. Available: https://www.nature.scot/sites/default/files/2023-12/160324%20-%20HMP%20guidance.pdf

A95

Scottish Forestry
Coilltearachd na h-Alba

Central Scotland Conservancy
Bothwell House, Hamilton Business Park,Caird Park
Hamilton ML3 0QA

Email:centralscotland.cons@forestry.gov.scot
Tel: 0300 067 6006

Conservator
Keith D Wishart FICFor

Nicola Ferguson
Case Officer,
Onshore Electricity, Strategy and Consents
Directorate for Energy and Climate Change
Scottish Government
5 Atlantic Quay,
150 Broomielaw
Glasgow G2 8LU

Monday 26th February 2024

ECU Planning Reference: ECU00004623
Scottish Forestry Reference: D32-169

Sent to Nicola.Ferguson@gov.scot

Dear Nicola

ELECTRICITY ACT 1989
THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION

Scottish Forestry would like to thank you for the opportunity to provide comment on the Scoping Opinion Request on the proposals for Hagshaw Energy Cluster – Western Expansion

Scottish Forestry is the Scottish Government agency responsible for forestry policy, support and regulation.

Scottish Government policy is opposed to the permanent removal of woodland for the purposes of conversion to another land use in line with the Control of Woodland Removal Policy and the Climate Change Plan 2018-2032.

We note from the scoping report that the developer appears to fully understand the extent of the forestry considerations applicable to this project and welcome the commitment to an iterative approach to forest planning proposed within the document. Scottish Forestry is content to provide advice on this matter as the project plans develop.

We also note and welcome that the developer appears committed to minimising the area of woodland removal required to just that necessary to facilitate construction and operation of the development. Nevertheless construction of the project will necessitate the permanent removal of forest and that being the case we offer the following advice.

Scottish Government planning policy seeks to protect the existing forest resource in Scotland, and supports woodland removal only where it would achieve significant and clearly defined additional public benefits. A proposal for compensatory planting may form part of the determination.

National Planning Framework 4 also places a responsibility on relevant authorities to identify how they will protect,

enhance and improve the resilience of its woodlands and should take cognisance of this when making planning decisions that could reduce or detrimentally effect woodland extent.

Woodland removal and compensatory planting

Where woodland is identified for permanent removal, a commitment to undertake compensatory planting is required.

We recommend that the following is addressed explicitly within any planning consent under which woodland removal is being approved.

- A Compensatory Planting Plan (content subject to agreement with Scottish Forestry) is provided that details the area of permanent deforestation that will result from the development. This plan should clearly articulate how that area has been calculated.

  The Compensatory Planting Plan must comply with the UK Forestry Standard and as a minimum include detail relating to species composition, design, cultivation and drainage, protection, deer management and ongoing maintenance requirements and monitoring.

- The area of land for which compensatory planting is proposed should be either under developer ownership or managed under a third party lease agreement of suitable timescale. This land should be capable of supporting woodland growth sufficient to result in the delivery of the required compensatory outcomes.

- Any appointed clerk of works should have an ecological background and their remit should include the monitoring of the establishment of any compensatory planting.

The applicant should be aware that certain changes within the UK Forestry Standard become active within Scotland on 1st October 2024. Given likely time required to develop this project and associated forestry plans we advise that the applicant considers and where appropriate factors these changes into planning for forest management.

If you would like to discuss any of the points raised in further detail, please do not hesitate to contact me.

Yours sincerely

REDACTED

Tom Hobbs

Senior Operations Manager
Scottish Forestry

A97

Wednesday, 06 March 2024

Local Planner
Energy Consents Unit
5 Atlantic Quay
Glasgow
G2 8LU

Development Operations
The Bridge
Buchanan Gate Business Park
Cumbernauld Road
Stepps
Glasgow
G33 6FB

Development Operations
Freephone Number - 0800 3890379
E-Mail - DevelopmentOperations@scottishwater.co.uk
www.scottishwater.co.uk

Dear Customer,

Hagshaw Energy Cluster, Western Expansion-, East Ayrshire, KA18 3NG
Planning Ref: ECU00004623
Our Ref: DSCAS-0105116-VW4
Proposal: The Proposed Development is a mixed renewable energy development principally comprising: _up to 26 wind turbines (c.187 megawatts (MW)), _solar photovoltaic (PV) panels (c.100 MW), and _on-site energy storage (c.200 MW) Its total generating capacity is anticipated to be up to approximately 0.487 gigawatts (GW). The associated infrastructure will include site access, internal access tracks, crane hardstandings, underground cabling, an on-site substation and maintenance building, temporary construction compounds, concrete batching plant(s), temporary laydown areas, borrow pit search areas and a met mast(s).

Please quote our reference in all future correspondence

Audit of Proposal

Scottish Water has no objection to this planning application; however, the applicant should be aware that this does not confirm that the proposed development can currently be serviced. Please read the following carefully as there may be further action required. Scottish Water would advise the following:

Drinking Water Protected Areas

A review of our records indicates that there are no Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity.

Surface Water

For reasons of sustainability and to protect our customers from potential future sewer flooding, Scottish Water will not accept any surface water connections into our combined sewer system.

There may be limited exceptional circumstances where we would allow such a connection for brownfield sites only, however this will require significant justification from the customer taking account of various factors including legal, physical, and technical challenges.

In order to avoid costs and delays where a surface water discharge to our combined sewer system is anticipated, the developer should contact Scottish Water at the earliest opportunity with strong evidence to support the intended drainage plan prior to making a connection request. We will assess this evidence in a robust manner and provide a decision that reflects the best option from environmental and customer perspectives.

General notes:

- Scottish Water asset plans can be obtained from our appointed asset plan providers:
    - Site Investigation Services (UK) Ltd
    - Tel: 0333 123 1223
    - Email: sw@sisplan.co.uk
    - www.sisplan.co.uk

I trust the above is acceptable however if you require any further information regarding this matter please contact me on **0800 389 0379** or via the e-mail address below or at planningconsultations@scottishwater.co.uk.

Yours sincerely,

Ruth Kerr.
Development Services Analyst
PlanningConsultations@scottishwater.co.uk

Scottish Water Disclaimer:

"It is important to note that the information on any such plan provided on Scottish Water's infrastructure, is for indicative purposes only and its accuracy cannot be relied upon. When the exact location and the nature of the infrastructure on the plan is a material requirement then you should undertake an appropriate site investigation to confirm its actual position in the ground and to determine if it is suitable for its intended purpose. By using the plan you agree that Scottish Water will not be liable for any loss, damage or costs caused by relying upon it or from carrying out any such site investigation."

A99

The Coal Authority

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG
T: 01623 637 119 (Planning Enquiries)
E: planningconsultation@coal.gov.uk
W: www.gov.uk/coalauthority

For the attention of: Ms N Ferguson - Case Officer
Energy Consents Unit | Onshore Electricity, Strategy and Consents

[By email: Nicola.Ferguson@gov.scot]

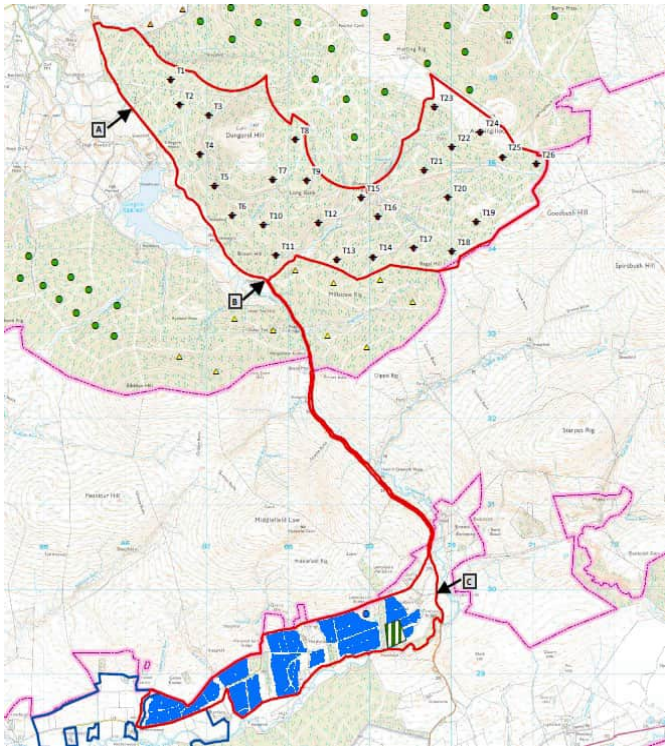
5th March 2024

Dear Ms Ferguson

Re: ECU00004623 - The proposed development is for upto 26 wind turbines with a maximum blade to tip height of 230m, and associated infrastructure; Hagshaw Clustera approximately 2.45km to the North of Muirkirk

Thank you for your notification of the 21st February 2024 seeking the further views of the Coal Authority on the above.

We note that the submission includes an updated Scoping Report for Phase 1, and site plan, the extent of which is indicated in the screen shot below.



Our records do not indicate the presence of any coal mining features at surface or shallow depth in the area identified above by the updated red line boundary. The authors of the revised Scoping Report state that while coal bearing bedrocks are present in the surrounding area, and correspond with a Development High Risk Area, these are not present underlying the Proposed Development site. On this basis further consideration of the potential risks posed by recorded coal mining features, on the site identified by the updated red line boundary, will not be necessary.

If you would like to discuss this matter further, please contact me on the above number.

Yours sincerely

REDACTED

Melanie Lindsley *BA (Hons), DipEH, DipURP, MA, PGCertUD, PGCertSP, MRTPI*
Principal Planning & Development Manager

Disclaimer

The above consultation response is provided by the Coal Authority as a statutory consultee and is based upon the latest available data and the electronic consultation records held by the Coal Authority since 1 April 2013. The comments made are also based on the information provided to the Coal Authority by the Local Planning Authority and/or information that has been published on the Council's website for consultation purposed in relation to this specific planning application. The views and conclusions contained in this response may be subject to review and amendment by the Coal Authority if additional or new data/information (such as a revised Coal Mining Risk Assessment) is provided by the Local Planning Authority or the applicant for consultation purposes.

In formulating this response the Coal Authority has taken full account of the professional conclusions reached by the competent person who has prepared the Coal Mining Risk Assessment or other similar report. In the event that any future claim for liability arises in relation to this development the Coal Authority will take full account of the views, conclusions and mitigation previously expressed by the professional advisors for this development in relation to ground conditions and the acceptability of development.

A101

Development Management and Strategic Road Safety
Roads Directorate

Buchanan House, 58 Port Dundas Road, Glasgow G4 0HF
Direct Line: 0141 272 7400
Alan.Kerr@transport.gov.scot

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Nicola Ferguson
Case Officer
Energy Consents Unit
Onshore Electricity, Strategy and Consents
Directorate for Energy and Climate Change
Scottish Government
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

Energy Consents Unit
Reference:
ECU00004623

Date: 13 March 2024

Dear Nicola,

ELECTRICITY ACT 1989

THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2017

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR HAGSHAW ENERGY CLUSTER – WESTERN EXPANSION

Introduction

The request for a scoping opinion for the proposed Hagshaw Energy Cluster Western Expansion, dated 21 February 2024, has been passed to Jacobs for review, in their role as Development Management Advisor and Auditor to Transport Scotland.

This consultation response is focused on matters related to the trunk road network and is primarily informed by the information provided in Chapter 11 of the Environmental Impact Assessment (EIA) Scoping Update Report, dated February 2024. This report focuses on the changes to the proposed technical and environmental assessment from that outlined in an earlier 2022 Scoping Report, arising from a reduction in the magnitude of the proposed development (see below). Hence, this response is also informed by the information provided in Chapter 11 of the previous EIA Scoping Report, dated September 2022.

Development Proposals

The proposed development is located approximately 2.5 km north of Muirkirk and is proposed to comprise up to 26 wind turbines, with a maximum height to blade tip of 230 m, and associated infrastructure, within South Lanarkshire and a co-located solar, battery energy storage system and substation development area located in East Ayrshire.

A previous scoping request was made in September 2022 for a larger development at the same site, with up to 72 turbines and associated infrastructure. The proposed Development would have been within the boundaries of both the Muirkirk and North Lowther Uplands Special Protection Area and the Muirkirk Uplands Site of Special Scientific Interest. Following this Scoping Opinion and further discussions with consultees, an updated scoping report has been submitted.

OBSERVATION 1: It is acknowledged that the battery energy storage system will be assessed as part of the EIA.

OBSERVATION 2: Timescales for construction of the development are not specified in the report. Graphic 3.1 (Indicative Project Programme) implies a timescale of 12 to 24 months, with an opening year of 2028, which could be brought forward to 2027. The site is intended to be operational for 40 years.

Methodology

Section 11.3 of the 2022 Scoping Report confirms that the assessment of effects will be undertaken in line with current guidance.

OBSERVATION 3: It is noted that the 2022 Scoping Report references the 'Guidelines for the Environmental Impact of Road Traffic' prepared by the Institute of Environmental Assessment. It should be noted, updated guidance was issued by the Institute of Environmental Management and Assessment (IEMA) in July 2023, titled 'Environmental Assessment of Traffic and Movement'. This updated guidance shall be used.

Baseline

Section 11.2 of the 2024 Scoping Update Report confirms that, following an initial review of the road network, the most viable route for delivering turbine components is likely to be via the existing road network (M74, A70, B743) from the nearest port of entry at King George V Dock in Glasgow.

OBSERVATION 4: It is acknowledged that an initial abnormal loads assessment has been undertaken on the route outlined, as illustrated on Figure 3.5 of the 2024 Scoping Update Report. However, a full abnormal loads assessment assessing the route from the Port of Entry to the site access, updated as necessary, should be submitted as supporting information.

The 2024 Scoping Update Report also confirms that general construction traffic will primarily use the A70 to access the site. This is accepted.

Borrow Pits

Paragraph 11.2.3 of the 2024 Scoping Update Report advises that "the Applicant is in the process of identifying suitable borrow pit search areas within the site and intends on including such areas within the application for consent. Should suitable borrow pit search areas not be identified within the site, the Applicant will need to make provision for the import of aggregate from a suitable off-site source(s) for construction purposes. It is however currently envisaged that the vast majority of stone required for construction will be won on site."

OBSERVATION 5: Full details of the proposed borrow pits, including dimensions and estimated aggregate yield, should be provided in the EIA. In the event the aggregate yield of the borrow pits is not sufficient, the detailed construction programme must be updated.

Proposed Study Area

Section 11.4 of the 2022 Scoping Report confirms that the study area will consider the slip roads to and from the M74 at Junction 11, the section of the B7078 linking the two slip roads and the B743 to the north of Muirkirk.

OBSERVATION 6: Transport Scotland would advise that study area road links must be clearly defined, with the points beyond which the effects of development traffic would likely be diluted clearly specified. A plan should be provided to illustrate the study area extents and should consider flows on the M74(T).

OBSERVATION 7: As referenced above, the abnormal loads assessment shall assess the route from the Port of Entry to the site access.

Desk and Field Surveys

It is confirmed, in Section 11.2 of the 2022 Scoping Report, that "data on traffic flows and accidents will be obtained for the roads likely to experience an increase in traffic arising from the Proposed Development", augmented by new surveys as appropriate. Any new surveys would take the form of week-long ATC surveys at four specified locations, which "would count all vehicles by direction and classification and record vehicle speed."

OBSERVATION 8: Transport Scotland are primarily concerned with trunk road network impacts. The suitability of information informing the assessment of effects on the local road network is regarded as a matter for consideration by the relevant Local Authority.

OBSERVATION 9: Any existing trunk road traffic data that may inform the traffic and transport assessment must be requested via traffic.data@mobiie.co.uk. Transport Scotland would highlight that Department for Transport (DfT) traffic count data is not an appropriate source of information for the assessment of trunk road traffic impacts. As stated in the DfT website data disclaimer, "traffic estimates for individual road links and small areas are less robust, as they are not always based on up-to-date counts made at these locations. Where other more up-to-date sources of traffic data are available (e.g. from local highways authorities), this may provide a more accurate estimate of traffic at these locations. It is the responsibility of the user to decide which data are most appropriate for their purpose, and if DfT road link level traffic estimates are used, to make a note of the limitations in any published material".

OBSERVATION 10: Where no trunk road traffic data is available and traffic surveys are proposed, the scope of the traffic surveys must first be agreed with Transport Scotland.

OBSERVATION 11: The anticipated opening year of the proposed development must be confirmed in the EIA.

OBSERVATION 12: The 2022 Scoping Report proposes the use of a low growth factor from the National Road Traffic Forecast (NRTF) dataset to factor flows observed on non-trunk roads to the year of construction and opening and a high growth NRTF factor for flows observed on trunk roads and motorways. A full justification for the use of these factors should be provided in the EIA.

Impact Assessment

OBSERVATION 13: Neither of the Scoping Reports specifically state what assessment will be carried out. This should be clearly specified in the EIA and should consider the methodology provided in the IEMA guidelines: 'Environmental Assessment of Traffic and Movement', which will likely include:

- Preparation of an ALA to confirm the proposed route from the Port of Delivery to the site access point and any potential pinch points on the route.
- Calculation of increased traffic generation on the surrounding road network during construction of the wind farm, solar, battery energy storage system, substation, and associated infrastructure, based on material and staffing requirements.
- Assessment of the environmental effects of increased traffic generation on the surrounding road network that is likely to be used during construction.
- Assessment of the effects associated with increased traffic through local small settlements including residential properties.

The 2022 Scoping Report confirms that the rules extracted from IEMA Guidelines will be used as a screening exercise to determine whether a detailed assessment of effects on the routes within the study area is necessary, with sensitivity and magnitude criteria applied to determine the significance of effects. It is acknowledged that the following two rules, also used in the updated IEMA guidelines, will be used to "identify the appropriate extent of the assessment area":

1. Include highway links where flows are predicted to increase by more than 30% or where the number of HGVs is predicted to increase by more than 30%; and
2. Include any other specifically sensitive area where traffic flows are predicted to increase by 10% or more.

The potential impacts proposed to be assessed, and listed in the Scoping Report, are:

- Severance
- Driver delay
- Pedestrian delay and amenity
- Accidents and safety
- Fear and intimidation.

OBSERVATION 14: The potential impacts shall be updated to be consistent with the IEMA guidelines published in July 2023.

In addition, the Scoping Report confirms that the potential for cumulative effects will also be considered. This is accepted.

OBSERVATION 15: It is noted that neither Scoping Report confirms anticipated assessment assumptions, e.g., the volume / percentage of construction material required to be transported to the development site. Full details of these must be provided in the EIA, supported by appropriate justification. Regarding the volume of material required to be transported to site, Transport Scotland would advise that a worst-case scenario shall be assessed.

OBSERVATION 16: The EIA chapter shall detail the potential number of daily, weekly, and total delivery numbers for the proposed development, providing confirmation of: estimated construction employee trips, the number, size, and weight of construction deliveries, and the anticipated schedule for deliveries.

OBSERVATION 17: The proposed construction traffic distribution and assignment shall be fully justified in the EIA chapter.

OBSERVATION 18: The proposed hours of operation for the development during the construction phase should be confirmed in the EIA, including any proposals to restrict construction traffic movements on specific days or at specific times.

OBSERVATION 19: A detailed construction programme must be provided, which sets out anticipated construction traffic volumes by month throughout the construction period. The maximum daily and hourly trip generation should be calculated, and details of construction staff trip generation should be provided.

OBSERVATION 20: A worst-case scenario in terms of construction material to be transported to site must be assessed and full details of any assumptions should be confirmed in the EIA. Should the volume required to be transported exceed that assessed, where this would alter assessment conclusions, the assessment is required to be updated and outcomes issued for consideration and approval by the Local Authority, in consultation with Transport Scotland.

OBSERVATION 21: Section 11.2 of the 2024 Scoping Update Report states that “potentially sensitive receptors will be identified” in the EIA. These should be appropriately considered in the assessment of effects where required.

OBSERVATION 22: Confirmation should be sought from the relevant Local Authority regarding committed developments that may need to be considered. An appropriate cumulative impact assessment should then be undertaken, if required. Full details of cumulative impacts should be set out, including a detailed programme indicating the worst-case combined trip generation and associated percentage impact relative to baseline traffic levels, both in terms of total traffic and the percentage increase in HGVs. Should impacts exceed assessment thresholds, full assessment of effects should be undertaken.

OBSERVATION 23: Full details of any assumptions applied in undertaking the traffic and transport assessment should be set out in the supporting information.

Mitigation

Section 11.6 of the 2022 Scoping Report confirms that potential mitigation may include provision of a Construction Traffic Management Plan (CTMP), as well as restrictions on vehicles routeings and times to avoid or reduce impacts on sensitive receptors. This is acknowledged.

OBSERVATION 24: Transport Scotland would advise that the preparation of a CTMP would be appropriate in this instance, as a best practice measure, regardless of the outcomes of the assessment of effects undertaken, and accept that an outline CTMP, as part of the EIA, is appropriate.

OBSERVATION 25: The traffic and transport assessment should assess residual impacts associated with the proposed development.

Scoped Out Effects

It is accepted that decommissioning effects are scoped out of the assessment.

Assessment of Accidents

OBSERVATION 26: Neither of the Scoping Reports confirms whether an assessment of historic accidents within the study area will be undertaken as part of the EIA transport and access chapter. Transport Scotland would highlight that an assessment of study area accident history is required and should include trunk road links within the assessment study area. Further, it should be noted that ‘CrashMap’ is not an appropriate source of information for the assessment of trunk road network accidents, as it may not include the latest available data for the road links assessed. Trunk road accident data must be requested from accidentdatarequests@transport.gov.scot. The extents of the accident assessment study area must be clearly defined in the traffic and transport assessment, with the end points of the study area specified, i.e., the locations beyond which no assessment has been undertaken. A plan should be provided to illustrate the locations of the accidents identified in the assessment and the associated severity. The assessment should identify whether any accident clusters are present within the study area and whether development traffic is likely to cause or exacerbate any road safety issues. Details of any proposed mitigation measures should also be provided.

Abnormal Loads

OBSERVATION 27: As highlighted in Observation 4, It is acknowledged that an initial abnormal loads assessment has been undertaken on the route illustrated on Figure 3.5 of the 2024 Scoping Update Report. However, a full Abnormal Loads Assessment (ALA), updated as

necessary, shall be submitted as supporting information alongside the EIA Transport and Access chapter, to enable Transport Scotland to respond to any forthcoming application.

OBSERVATION 28: The following aspects should be confirmed in the ALA:

- Port of entry for shipping of wind turbine components.
- The number and dimensions of abnormal loads and transporting vehicle, i.e., weight limits, length etc.
- All trunk roads to be used by abnormal load vehicles.
- A route review should be undertaken considering the horizontal and vertical alignment of the preferred route(s), defining locations where a detailed swept path assessment is required.
- Swept paths analysis are required for turbine blades and turbine tower sections, and associated drawings must be provided.
- Key organisations to be consulted along the proposed routes should be identified.
- Initial consideration of: The maximum axle loading on structures in consultation with the relevant roads agencies; clear heights in consultation with utility providers and transport agencies; roadworks or closures that could affect the passage of the loads; underground services on the proposed route; satisfaction of Police Scotland and local authority to the proposed route(s); lay-by areas that can be utilised for temporary parking; and lay-bys that can be used to let traffic pass slow moving abnormal loads.
- Any other obstructions that may restrict transportation of abnormal loads.
- Details of measures to mitigate the impacts of abnormal load movements.
- Drawings providing details of proposed mitigation measures.
- Geometry and visibility at access point(s) to / from trunk road.
- Abnormal Loads Management Plan introducing measures that could help reduce the impact of abnormal load convoys.

The ALA must consider the full extent of the proposed abnormal loads route between the port of entry and the proposed development.

Site Access

Chapter 11 of the 2024 Scoping Update Report confirms that the site will be accessed through the modification of junctions on the B743. This is a matter for consideration by the relevant Roads Authority.

We trust this is satisfactory, but should you have any queries please do not hesitate to contact us.

Yours sincerely,

REDACTED

Alan Kerr

Alan.Kerr@transport.gov.scot

Transport Scotland

Roads Directorate

cc Chris Buck, Jacobs

ANNEX B

Marine Directorate – Science Evidence Data and Digital (MD-SEDD) advice on freshwater and diadromous fish and fisheries in relation to onshore wind farm developments.

July 2020 updated September 2023

Marine Directorate – Science Evidence Data and Digital (MD-SEDD) provides internal, non-statutory, advice in relation to freshwater and diadromous fish and fisheries to the Scottish Government's Energy Consents Unit (ECU) for onshore wind farm developments in Scotland.

Atlantic salmon (*Salmo salar*), sea trout and brown trout (*Salmo trutta*) are of high economic value and conservation interest in Scotland and for which MD-SEDD has in- house expertise. Onshore wind farms are often located in upland areas where salmon and trout spawning and rearing grounds may also be found. MD-SEDD aims, through our provision of advice to ECU, to ensure that the construction and operation of these onshore developments do not have a detrimental impact on the freshwater life stages of these fish populations.

The Electricity Works (Environmental Impact Assessment) (EIA) (Scotland) Regulations (2017) state that the EIA must assess the direct and indirect significant effects of the proposed development on water and biodiversity, and in particular species (such as Atlantic salmon) and habitats protected under the EU Habitats Directive. Salmon and trout are listed as priority species of high conservation interest in the Scottish Biodiversity Index and support valuable recreational fisheries.

A good working relationship has been developed over the years between ECU and MD-SEDD, which ensures that these fish species are considered by ECU during all stages of the application process of onshore wind farm developments and are similarly considered during the construction and operation of future onshore wind farms. It is important that matters relating to freshwater and diadromous fish and fisheries, particularly salmon and trout, continue to be considered during the construction and operation of future onshore wind farms.

In the current document, MD-SEDD sets out a revised, more efficient approach to the provision of our advice, which utilises our generic scoping and monitoring programme guidelines (https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Research/onshoreren). This standing advice provides regulators (e.g. ECU, local planning authorities), developers and consultants with the information required at all stages of the application process for onshore wind farm developments, such that matters relating to freshwater and diadromous fish and fisheries are addressed in the same rigorous manner as is currently being carried out and continue to be fully in line with EIA regulations. At the request of ECU, MD-SEDD will still be able to provide further and/or bespoke advice relevant to freshwater and diadromous fish and fisheries e.g. site specific advice, at any stage of the application process for a proposed development, particularly where a development may be considered sensitive or contentious in nature.

MD-SEDD will continue undertaking research, identifying additional research requirements, and keep up to date with the latest published knowledge relating to the

impacts of onshore wind farms on freshwater and diadromous fish populations. This will be used to ensure that our guidelines and standing advice are based on the best available evidence and also to continue the publication of the relevant findings and knowledge to all stakeholders including regulators, developers and consultants.

MD-SEDD provision of advice to ECU

- MD-SEDD should not be asked for advice on pre application and application consultations (including screening, scoping, gate checks and EIA applications). Instead, the MD-SEDD scoping guidelines and standing advice (outlined below) should be provided to the developer as they set out what information should be included in the EIA report;
- if new issues arise which are not dealt with in our guidance or in our previous responses relating to respective developments, MD-SEDD can be asked to provide advice in relation to proposed mitigation measures and monitoring programmes which should be outlined in the EIA Report (further details below);
- if new issues arise which are not dealt with in our guidance or in our previous responses, MD-SEDD can be asked to provide advice on suitable wording, within a planning condition, to secure proposed monitoring programmes, should the development be granted consent;
- MD-SEDD cannot provide advice to developers or consultants, our advice is to ECU and/or other regulatory bodies.
- if ECU has identified specific issues during any part of the application process that the standing advice does not address, MD-SEDD should be contacted.

MD-SEDD Standing Advice for each stage of the EIA process

Scoping

MD-SEDD issued generic scoping guidelines (https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Research/onshoreren) which outline how fish populations can be impacted during the construction, operation and decommissioning of a wind farm development and informs developers as to what should be considered, in relation to freshwater and diadromous fish and fisheries, during the EIA process.

In addition to identifying the main watercourses and waterbodies within and downstream of the proposed development area, developers should identify and consider, at this early stage, any areas of Special Areas of Conservation where fish are a qualifying feature and proposed felling operations particularly in acid sensitive areas.

If a developer identifies new issues or has a technical query in respect of MD-SEDD generic scoping guidelines then ECU should be informed who will then co-ordinate a response from MD-SEDD.

Gate check

The detail within the generic scoping guidelines already provides sufficient information relating to water quality and salmon and trout populations for developers at this stage of the application.

Developers will be required to provide a gate check checklist (annex 1) in advance of their application submission which should signpost ECU to where all matters relevant to freshwater and diadromous fish and fisheries have been presented in the EIA report. Where matters have not been addressed or a different approach, to that specified in the advice, has been adopted the developer will be required to set out why.

EIA Report

MD-SEDD will focus on those developments which may be more sensitive and/or where there are known existing pressures on fish populations (https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/fishreform/licence/status/Pressures). The generic scoping guidelines should ensure that the developer has addressed all matters relevant to freshwater and diadromous fish and fisheries and presented them in the appropriate chapters of the EIA report. Use of the gate check checklist should ensure that the EIA report contains the required information; the absence of such information may necessitate requesting additional information which may delay the process:

Developers should specifically discuss and assess potential impacts and appropriate mitigation measures associated with the following:

- any designated area, for which fish is a qualifying feature, within and/or downstream of the proposed development area;
- the presence of a large density of watercourses;
- the presence of large areas of deep peat deposits;
- known acidification problems and/or other existing pressures on fish populations in the area; and
- proposed felling operations.

Post-Consent Monitoring

MD-SEDD recommends that a water quality and fish population monitoring programme is carried out to ensure that the proposed mitigation measures are effective. A robust, strategically designed and site specific monitoring programme conducted before, during and after construction can help to identify any changes, should they occur, and assist in implementing rapid remediation before long term ecological impacts occur.

MD-SEDD has published guidance on survey/monitoring programmes associated with onshore wind farm developments (https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Research/onshoreren) which developers should follow when drawing up survey and/or monitoring programmes.

If a developer considers that such a monitoring programme is not required then a clear justification should be provided.

Planning Conditions

MD-SEDD advises that planning conditions are drawn up to ensure appropriate provision for mitigation measures and monitoring programmes, should the development be given consent. We recommend, where required, that a Water Quality Monitoring Programme, Fisheries Monitoring Programme and the appointment of an Ecological Clerk of Works, specifically in overseeing the above monitoring programmes, is outlined within these conditions and that MD-SEDD is consulted on these programmes.

Wording suggested by MD-SEDD in relation to water quality, fish populations and fisheries for incorporation into planning consents:

1. No development shall commence unless a Water Quality and Fish Monitoring Plan (WQFMP) has been submitted to and approved in writing by the Planning Authority in consultation with Marine Directorate – Science Evidence Data and Digital (MD–SEDD) and any such other advisors or organisations.

2. The WQFMP must take account of the Scottish Government's MD-SEDD guidelines and standing advice and shall include:

    a. water quality sampling should be carried out at least 12 months prior to construction commencing, during construction and for at least 12 months after construction is complete. The water quality monitoring plan should include key hydrochemical parameters, turbidity, and flow data, the identification of sampling locations (including control sites), frequency of sampling, sampling methodology, data analysis and reporting etc.;

    b. the fish monitoring plan should include fully quantitative electrofishing surveys at sites potentially impacted and at control sites for at least 12 months before construction commences, during construction and for at least 12 months after construction is completed to detect any changes in fish populations; and

    c. appropriate site specific mitigation measures detailed in the Environmental Impact Assessment and in agreement with the Planning Authority and MD-SEDD.

3. Thereafter, the WQFMP shall be implemented within the timescales set out to the satisfaction of the Planning Authority in consultation with MD- SEDD and the results of such monitoring shall be submitted to the Planning Authority on a 6 monthly basis or on request.

Reason: To ensure no deterioration of water quality and to protect fish populations within and downstream of the development area.

Sources of further information

NatureScot (previously “SNH”) guidance on wind farm developments - https://www.nature.scot/professional-advice/planning-and-development/advice- planners-and-developers/renewable-energy-development/onshore-wind- energy/advice-wind-farm

Scottish Environment Protection Agency (SEPA) guidance on wind farm developments – https://www.sepa.org.uk/environment/energy/renewable/#wind

A joint publication by Scottish Renewables, NatureScot, SEPA, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science (now MD-SEDD) and Association of Environmental and Ecological Clerks of Works (2019) Good Practice during Wind Farm Construction - https://www.nature.scot/guidance- good-practice- during-wind-farm-construction.

Annex 1 (revised September 2023)

Marine Directorate – Science Evidence Data and Digital (MD-SEDD) – EIA Checklist

The generic scoping guidelines should ensure that all matters relevant to freshwater and diadromous fish and fisheries have been addressed and presented in the appropriate chapters of the EIA report. Use of the checklist below should ensure that the EIA report contains the following information; the absence of such information ***may necessitate requesting additional information*** which could delay the process:

MD-SEDD Standard EIA Report Requirements	Provided in application YES/NO	If YES – please signpost to relevant chapter of EIA Report	If not provided or provided different to **MD-SEDD** advice, please set out reasons.
1. A map outlining the proposed development area and the proposed location of: ○ the turbines, ○ associated crane hard standing areas, ○ borrow pits, ○ permanent meteorological masts, ○ access tracks including watercourse crossings, ○ all buildings including substation, battery storage; ○ permanent and temporary construction compounds; ○ all watercourses; and ○ contour lines;			

2. A description and results of the site characterisation surveys for fish (including fully quantitative electrofishing surveys) and water quality including the location of the electrofishing and fish habitat survey sites and water quality sampling sites on the map outlining the proposed turbines and associated infrastructure. **This should be carried out where a Special Area of Conservation (SAC) is present and where salmon are a qualifying feature, and in exceptional cases when required in the scoping advice for other reasons. In other cases, developers can assume that fish populations are present**;			
3. An outline of the potential impacts on fish populations and water quality within and downstream of the proposed development area;			
4. Any potential cumulative impacts on the water quality and fish populations associated with adjacent (operational and consented) developments including wind farms, hydro schemes, aquaculture and mining;			

5. Any proposed site specific mitigation measures as outlined in **MD-SEDD** generic scoping guidelines and the joint publication "Good Practice during Wind Farm Construction" (https://www.nature.scot/guidance-good-practice-during-wind-farm-construction);			
6. Full details of proposed monitoring programmes using guidelines issued by **MD-SEDD** and accompanied by a map outlining the proposed sampling and control sites in addition to the location of all turbines and associated infrastructure. **At least 12 months of baseline pre-construction data should be included. The monitoring programme can be secured using suitable wording in a condition.**			
7. A decommissioning and restoration plan outlining proposed mitigation/monitoring for water quality and fish populations. **This can be secured using suitable wording in a condition.**			

Developers should specifically discuss and assess potential impacts and appropriate mitigation measures associated with the following:	Provided in application YES/NO	If YES – please signpost to relevant chapter of EIA Report	If not provided or provided different to **MD-SEDD** advice, please set out reasons.
1. Any designated area **(e.g. SAC),** for which fish is a qualifying feature, within and/or downstream of the proposed development area;			
2. The presence of a large density of watercourses;			
3. The presence of large areas of deep peat deposits;			
4. Known acidification problems and/or other existing pressures on fish populations in the area; and			
5. Proposed felling operations.			