Technical Appendix 1.5: Scoping Opinion

Scottish Government
Riaghaltas na h-Alba
gov.scot

CONTENTS

The Scottish Government
Energy Consents Unit

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

WATCHMAN ENERGY PARK
Renewco Power Limited

13 March 2025

1. Introduction

1.1 This scoping opinion is issued by the Scottish Government Energy Consents Unit on behalf of the Scottish Ministers to Renewco Power Limited a company incorporated under the Companies Acts with company number SC708511 and having its registered office at 10 Newton Place, Glasgow, Scotland, G3 7PR ("the Company") in response to a request dated 19 November 2024 for a scoping opinion under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 in relation to the proposed Watchman Energy Park ("the proposed development"). The request was accompanied by a scoping report.

1.2 The proposed development would be located on land located approximately 9 kilometres (km) west of the M74 and approximately 10 km south of Crawford, 7 km south of Elvanfoot and 12 km west of Moffat, South Lanarkshire Council (SLC).

1.3 The proposed development would have a total generating capacity in excess of 50 megawatts ("MW") , anticipated to comprise of 16 wind turbines at 240m maximum tip height, each with a generating capacity of up to 5 MW. There is also potential for a Battery Energy Storage System ("BESS") with up to 50 MW capacity.

1.4 In addition to Watchman Energy Park there will be ancillary infrastructure including:

- permanent foundations supporting each wind turbine, and associated crane hardstanding at each wind turbine base;
- a series of new on-site access tracks with associated watercourse crossings (where the final layout dictates);
- underground power cables, generally laid in trenches alongside access tracks;
- an onsite substation and control building;
- temporary construction compounds and laydown areas; and

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 solely within the planning authority of South Lanarkshire Council.

1.7 The Site is located between 27 km and 33 km west of the Eskdalemuir Seismic Array. The site is not within 10 km of any Special Protected Areas (SPA) or Special Areas of Conservation (SAC), However, there is a Site of Special Scientific Interest (SSSI) located within a 5 km radius. The southern area of the Site overlaps with one statutory designated site, Shiel Dod SSSI which is designated for blanket bog; it is not proposed to introduce development within Shiel Dod SSSI. There are operational windfarms within the surrounding landscape of the proposed development, including Clyde and Extension to the northeast and Harestanes to the southeast.

2. Consultation

2.1 Following the scoping opinion request a list of consultees was agreed between Ramboll UK Limited(acting as the Company's agent) and the Energy Consents Unit. A consultation on the scoping report was undertaken by the Scottish Ministers and this commenced on 04 December 2024. The consultation closed on 06 January 2025. Extensions to this deadline were granted to NatureScot, Crown Estate and RSPB Scotland. The Scottish Ministers also requested responses from their internal advisors Transport Scotland and Scottish Forestry. Standing advice from Marine Directorate – Science Evidence Date 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:

- Scottish Forestry
- Civil Aviation Authority
- Crown Estate Scotland
- Fisheries Management Scotland
- Clyde River Foundation
- John Muir Trust
- Scottish Wildlife Trust
- Scottish Wild Land Group
- Visit Scotland
- Woodland Trust
- Scottish Power Energy Networks
- Scottish Fire and Rescue service
- West of Scotland Archaeology Service
- Crawford and Elvanfoot CC
- Thornhill CC
- Closeburn CC
- Kirkpatrick CC
- Moffat and District CC
- Carronbridge CC

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 South Lanarkshire Council, within whose area the proposed development would be situated, NatureScot (previously "SNH"), Scottish Environment Protection Agency 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 dated 19 November 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 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**.

3.5 Scottish Ministers are satisfied with the scope of the EIA set out at Section **3** of 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. 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 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 provided information on whether there are any drinking water protected areas or Scottish Water assets on which the development could have any significant effect. Scottish Ministers request that the company contacts Scottish Water (via EIA@scottishwater.co.uk) and makes further enquires to confirm whether there any Scottish Water assets which may be affected by the development, and includes details in the EIA report of any relevant mitigation measures to be provided.

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 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 proposed viewpoints at Table 3.4 to be assessed within the landscape and visual impact assessment. South Lanarkshire Council state that they are content with the extent of the proposed viewpoints which are detailed in Table 3.4 and do not consider that any additional viewpoints need to be added to those already identified. NatureScot have no further requests with regards to the viewpoints.

3.15 The noise assessment should be carried out in line with relevant legalisation and standards as detailed in section 3.9 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 The Scottish Ministers are aware that the proposed development falls within the statutory safeguarded area around Eskdalemuir Seismological Recording Station. Scientific research has established that wind turbines of current design generate noise emissions that cause seismic vibrations which can interfere with the effective operation of the array. In order to ensure the United Kingdom can continue to implement its obligations in maintaining the Comprehensive Nuclear Test Ban Treaty, a noise budget has been allocated to regulate the development of wind turbines within a 50km radius of the array.

3.17 As advised by the Defence Infrastructure Organisation ("the DIO"), the budget has been set at 0.336nm rms and at present the reserved noise budget has been reached. Consequently, the DIO has stated there would be concerns if this proposal progresses to application based upon current information.

3.18 The Scottish Ministers request that the company keep up to date with the information provided by the Eskdalemuir Working Group (EWG) and contact the Defence infrastructure Organisation at the earliest opportunity to discuss any possible mitigation measures. Enquiries regarding the work being undertaken by EWG can be directed to onshorewindpolicy@gov.scot

3.19 As the maximum blade tip height of turbines exceeds 150m the LVIA as detailed in section 3.3 of 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.

3.20 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.

3.21 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'***.

3.22 The Scottish Ministers request that the company assess the impact of the proposed development on existing and/or planned infrastructure. In particular, the company should carry out the necessary assessments to confirm if any part of the proposed development is within the consultation zone of any of the following:-

- a licenced explosives site;
- gas (or any other) pipeline;
- existing overhead electric lines;
- underground cables;
- water pipes;
- telecommunications links.

3.23 Scottish Ministers request the company to assess if any flammable, toxic or explosive chemicals detailed in The Town and Country Planning (Hazardous Substances) (Scotland) Regulations 2015 would be stored on site in quantities such that a Hazardous Substances Consent would be required under section 2 of the Planning (Hazardous Substances) (Scotland) Act 1997.

3.24 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.

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).

Kevin Ainslie

Energy Consents Unit

13 March 2025

ANNEX A

Consultation

List of consultees who provided a response.

- South Lanarkshire Council A1-A10
- SEPA A11-A55
- NatureScot A56-A61
- HES A62-A67
- The British Horse Society A68-A69
- BT A70-A73
- Defence Infrastructure Organisation A74-A76
- Edinburgh Airport A77
- Glasgow Airport A78
- Glasgow Prestwick Airport A79-A84
- Health and Safety Executive A85-A86
- Joint Radio Company A87-A89
- Montaineering Scotland A90-A91
- NATS Safeguarding A92-A102
- RSPB Scotland A103-A105
- ScotWays A106-A115
- Scottish Water A116-A119
- Transport Scotland A120-A121

Internal advice from areas of the Scottish Government was provided by officials from Transport Scotland and Marine Directorate (in the form of standing advice from Marine Directorate – Science Evidence Data and Digital (MD-SEDD or bespoke advice from Marine Directorate – Science Evidence Data and Digital (MD-SEDD)

See Section 2.4 above for a list of organisations that were consulted but did not provide a response.

A1

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

Energy Consents Unit
FAO Mr Colin Abercrombie

By e-mail only

Our ref: P/24/1438
Your ref: ECU00006030
If calling ask for: Andrew Bennie
Phone:07386 964006
Date: 23rd January 2025

Dear Sirs

Electricity Act 1989

The Electricity Works (environmental Impact Assessment) (Scotland) regulations 2017

Request for Scoping Opinion for Proposed Section 36 Application for Watchman Energy Park

I refer to your request for comments to inform a scoping opinion made under regulation 12 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Following internal consultation, South Lanarkshire Council, as Planning Authority would offer the following comments, noting that these comments are made in relation to the above scoping opinion request only and do not provide comment on the proposals themselves.

The structure of the scoping report is considered clear and sets out a prudent approach to the topics that may give rise to likely significant environmental effects and should be fully assessed in the EIA Report. The topics listed in the scoping report are acceptable to the Council and should be fully assessed within the EIA Report.

In addition to the proposed topics, the Council would ask that the EIAR contain a standalone chapter which sets out clearly the proposed mitigation and enhancement measures which

A2

are to be brought forward to address those impacts that will/may arise because of the proposed development.

In addition to the matters set out above, the following responses are made in response to the "Questions for Consultees" which are set out within the Scoping Report.

Table 3.5

LV1: Having reviewed the same, SLC agree that the extent of the proposed Study Areas is appropriate and as such can be agreed.

LV2: SLC are content with the methodology to be followed in the preparation of the LVIA.

LV3: SLC are content with the approach which has been proposed in relation to undertaking the viewpoint photography and in the preparation of the visualisations.

LV4: SLC are content with the extent of the proposed viewpoints which are detailed in Table 3.4 and do not consider that any additional viewpoints need to be added to those already identified.

LV5: SLC are content as to the suggested approach relation to the assessment of cumulative impacts associated with the proposed development.

LV6: SLC agree that there are unlikely to be any significant effects arising during the decommissioning phase of the proposed development and that as such it is reasonable that this issue be scoped out of the LVIA.

Table 3.6

CH1: SLC find both the assessment methodology and proposed Study Areas to be acceptable.

CH2: SLC do not consider that there are any further assets beyond the boundary of the proposed study area which could be subject to any significant effects.

CH3: SLC do not consider that any additional assets will require to be the subject of any visualisations.

Table 3.9

ECO1: SLC are content as to the extent of the identified consultees.

ECO2: SLC agree that the identified field surveys, augmented by a suitable desk top study are suitable and sufficient to ensure that full and robust impact assessment can be undertaken.

ECO3: SLC agree that both the methodology and scope of the assessment is acceptable and appropriate.

ECO4: SLC agree that the features listed within Table 3.9 can be scoped out of the proposed assessment.

Table 3.12

ORN1: SLC agree that the range of the identified ornithological undertaken are both sufficient and appropriate.

ORN2: SLC agree that the survey areas and associated buffers adopted for each of the ornithological surveys are appropriate.

ORN3: SLC do not consider that any additional consultees require to be consulted in relation to this aspect of the wider assessment.

ORN 4: SLC agree that the identified features/impacts may be scoped out for further assessment without affecting the overall integrity of the assessment.

Table 3.13

HYD1: SLC consider that the assessment methodology and associated Study Areas are appropriate and acceptable.

HYD2: SLC do not consider that any consultees need be consulted in connection with this aspect of the wider assessment.

HYD3: SLC agree with the extent of those features which it is proposed be scoped out for any further assessment.

Table 3.14

TT1: SLC agree with the extent of the proposed Study Area.

TT2: SLC agree that impacts arising during the operational and decommissioning phases of the proposed development can be scoped out of the EIA.

In addition to the above noted responses, the following comments are made in relation to the assessment of the transportation related considerations associated with the proposed development.

Access & Impact

The EIA Scoping Report does not specify a proposed point of access off the public road for HGV and specialist component delivery vehicles with general reference to using either the A702 or B7076 from the M74 and that further details will be developed.

Notwithstanding the above, as part of a formal planning application we would expect the applicant to submit a transport statement assessing development impacts. The assessment should include the following:

1. Delivery route plans for HGV and abnormal loads from the M74 to the proposed site entrance(s); this should include battery loads and substation/transformers. Routes and distribution for HGV movements should be detailed. This will be used to develop an 'Agreed Route' plan for inclusion within planning agreements.

2. An anticipated development programme to be included in the EIA broken down to show monthly movements for HGV and abnormal loads and in case of HGV movements this should be subdivided by construction activity e.g., timber extraction, stone delivery, concrete delivery, steel delivery, compound, battery, solar, transformers, substation, cabling etc. This will inform the profile of trips and peak movements.
3. Scenario to be included for 100% importation of aggregates in event that suitable borrow pits cannot be identified. Borrow pits and their estimated volumes should be clarified where such pits are expected to be used. We also require volumes/vehicle movements associated with any expected removal of surplus material.
4. Assessment of baseline traffic against anticipated trips for all construction vehicle movements at key locations along the route within South Lanarkshire.
5. Impact on existing walking and cycling routes to be assessed. The applicant should seek advice from the Council's Access Development Officer (CAG@southlanarkshire.gov.uk).
6. Swept path analysis to identify pinch points requiring road widening, overrun areas and/or alterations to street furniture as part of an Abnormal Load Route Assessment (ALRA). The applicant should also consider whether these works will have an impact on existing trees/vegetation in accordance with BS5837: Trees in Relation to Design, Demolition and Construction to Construction – Recommendations.
7. Bridge assessments and principal inspections will be required for all abnormal loads transported along on the A702 and B7076 to the site entrances. Further advice can be sought on those structures affected by the route and Bridge Bond requirements by contacting the Council's Bridges and Structures Team Leader (james.gray@southlanarkshire.gov.uk). A minimum four-month period is recommended for submission of abnormal load route/bridge assessments in advance of any movements for approval.

Grid Connection

There are no proposals at this stage which we expect will be addressed under a separate application.

Visibility

No definitive point(s) of access are not provided therefore we are unable to comment at this stage however we would provide the following guidance.

Visibility splays shall be appropriate to the speed limit in force at the point of access with 2.4metres x 215metres splays being required at locations subject to the national speed limit.

We acknowledge however that vehicle speeds may be lower than the signed speed limit given the local characteristics on a stretch of road which may allow a reduction in the visibility splay requirements. Therefore, we are willing to consider visibility splay reductions where the applicant can demonstrate, by means of a continuous 7-day vehicle speed survey, that the 85th percentile speed is lower than the signed speed limit in force on this section of road. Separate vehicle speed survey points should be established on each approach at the limit of the anticipated visibility splay and not at the access itself. The two survey points may yield different results therefore visibility splays may be different in each direction. The resultant 85th percentile speed (wet weather) for each direction can be compared to the provisions in Table 8 of the SCOTS National Roads Development Guide to determine an appropriate junction visibility splay for each direction.

Furthermore, the applicant must demonstrate that they have legal rights to remove everything within the visibility envelope that exceeds 1.05metres in height above the adjacent road channel level and to maintain the visibility splay free of obstructions for the life of the project.

Depending on the length of the visibility splay the applicant may also need to demonstrate how the splays can be achieved in the vertical plane considering physical characteristics such as neighbouring boundary features (walls/hedges/fences/steep verges). The applicant may need to undertake a topographical survey of the verge features and levels in both directions to help demonstrate what can be achieved.

8. The applicant shall provide plans showing required visibility splays and where necessary results of vehicle speed surveys to support a reduction in the Y-distance where sought. The splays shall be assessed in the horizontal and, where necessary, the vertical plane. The applicant shall also demonstrate that they have all necessary agreements to implement and maintain the visibility splays for land out with their ownership/control.

Drainage

The Council's ***Developer Design Guidance: Flood Risk Assessments and Sustainable Drainage Systems (May 2020)*** highlights requirements in respect of Flood Risk Assessment and Drainage Strategy. We note that you have consulted our Flood Risk Management colleagues who will be able to provide advice on their requirements for information in support of the current application including proposals for future maintenance access and responsibilities.

9. Notwithstanding the above comments, any works associated with formation of the site access off the public road shall be designed to prevent surface water discharging onto the public road. The applicant will be expected to provide proposals for this.

Road Safety Audit

10. The detailed planning application shall include a Stage 1 Road Safety Audit and Designers response covering any proposed site access(es)/alteration to existing access(es) and for any works to amend the existing public road.

It should be noted that a Stage 2 Road Safety Audit along with the Designer's Response will be required to accompany the detailed drawing submission as part of the future Section 56 applications or road construction consent applications.

Other

The developer will need to provide turning areas on site to enable all vehicles to enter and exit site in a forward gear. Proposals shall include arrangements for wheel wash facilities to prevent mud and debris being deposited onto the public road during the construction phase. Staff and contractor car parking will be required based on estimated peak staffing levels. No construction vehicles will be permitted to park on any part of the public road.

A roads dilapidation survey will be required for the site access which shall be undertaken in conjunction with the Roads Department, during and on completion of all site work with the frequency of interim inspections as directed by the Roads Department. Written reports shall include photographs, records plans and defect descriptions for each inspection and be submitted for record purposes within timescales set by the Council. The applicant will be

responsible for repairing any damage to the road deemed by the Council to be a consequence of their activities within timescales and specification acceptable to the Council.

11. The requirement for road cleaning, road dilapidation surveys and a traffic management plan can all be addressed by suitably worded pre-commencement planning conditions and shall include, where appropriate, any timber felling activities.

12. The developer will be expected to enter into a Section 96 Agreement with the Council as Roads Authority covering extraordinary wear and tear to the public road (B7076) although consideration will be given to an upfront payment in lieu of a Section 96.

13. The windfarm developer will be expected to enter into a Section 96 Agreement covering structures and will need to lodge a Bridge Bond before works commence on site.

Table 3.15

NV1: SLC agree to the proposed assessment methodologies and to the application and use of the various “standards” specified.

NV2: SLC agree to these specific matters being scoped out of the EIA.

In addition to these responses, the undernoted comments made by the Council’s Environmental Health Service.

The Service would agree that the controlling receptors for the development and the cumulative emission should be considered. 10dB below contribution to receptors would not influence the acoustic climate. The Service agree that levels shall be within the available headroom and comply with relevant standards.

Vibration is unlikely to be an issue. Construction noise associated with the BESS could be covered relative to BS5228 guidelines such as the ABC method. Noise projections for construction would not be required unless target values are likely to be exceeded.

Low frequency infrasound can be scoped out based on the current evidence base.

The Services will engage with consultants in considering the assessment methodology. Construction noise for the windfarm development is welcomed.

The assessment shall use the principles set out in the document “The Assessment and rating of Noise from Wind Farms (ETSU-R-97)”. In addition, cognisance shall be given to-

- AMWG Final Report-09-08-2016
- IOA statement on wind farm noise assessment 19-12-2014.
- IOA Good Practice Guide on Wind Turbine Noise - May 2013.
- IOA GPG SGN No 1 Final Sept 2014.

- IOA GPG SGN No 2 Final Sept 2014.
- IOA GPG SGN No 3 Final July 2014.
- IOA GPG SGN No 4 Final July 2014.
- IOA GPG SGN No 5 Final July 2014.
- IOA GPG SGN No 6 Final July 2014

Based on the cumulative impact, the simplified model would not be an appropriate approach.

A hybrid approach to the assessment of the acoustic environment to establish limits should be discussed to ensure a suitably robust methodology to establish available headroom. Remote monitoring as appropriate shall be carried out to corroborate and ensure a contemporaneous objective assessment of the acoustic environment.

The BESS development should demonstrate compliance with -

Part 1

Between the hours of 08:00 and 20:00 the measured noise rating level emitted from the development (LAr,1hr) shall not exceed the background noise level (LA90,30 min) by more than 4dB within the curtilage any residential amenity space. This shall be measured in accordance with British Standard BS 4142:2014+A1:2019- Method for Rating and Assessing Industrial and Commercial Sound at the proposed development. Between the hours of 20:00 and 08:00 the noise rating level emitted from the development (LAr,15 min) shall not exceed the background noise level (LA90,30min) by more than 4dB. This shall be measured in accordance with BS 4142:2014+A1:2019 at the proposed development.

Part 2

The resultant internal noise levels within any residential property shall comply with BS 8233:2014 Guidance on sound insulation and noise reduction for buildings as follows-

a) The internal levels with windows open do not exceed an LAeq,16hr of 40dB daytime (07:00 – 23:00)

b) The internal levels with windows open do not exceed an LAeq,8hr of 30dB night-time (23:00 – 07:00).

c) The internal levels with windows open do not exceed an LAmax of 45dB night-time (23:00 – 07:00).

d) The external levels shall not exceed an LAeq,16hr of 50dB daytime in any garden amenity areas, when measured free-field

Part 3

The Internal Noise Rating Values, within any residential property and resultant from the development shall not exceed-

- NR25 between 23.00hrs and 08.00hrs
- NR35 between 08.00hrs and 23.00hrs

Where Blasting is intended for barrow pits a blasting method statement shall be submitted in writing and approved by the Planning Authority.

The method statement shall include details of measures required to minimise the impact of blasting on residential and other noise-sensitive properties in the vicinity of the site. It shall also include the following measures:

- Blasting shall be carried out using the best practicable means of ensuring that the resultant noise, vibration and air overpressure are minimised.
- Blasting techniques and instantaneous charge levels shall be employed such that the predicted peak particle velocity shall not exceed 6 mm/s in any plane in 95% of all blasts, and no individual blast shall exceed a peak particle velocity of 12 mm/s as would be measured on the ground adjacent to any vibration-sensitive building;
- Under normal atmospheric conditions, the peak linear overpressure level shall not exceed 120dB as measured from any neighbouring noise sensitive premises;
- Within the constraints of safe practice, blasting shall be avoided under weather conditions which are likely to direct or focus the blast air overpressure towards neighbouring noise sensitive properties
- Blasting shall thereafter be carried out in accordance with the approved method statement, unless otherwise agreed in writing with the Planning Authority.

Table 3.16

AV1: SLC agree with the proposed methods to be followed in terms of the establishing the baseline position in respect of this aspect of the overall assessment.

AV2: SLC agree to the extent of those matters which are to be scoped into the assessment.

AV3: SLC agree to the extent of those matters that are to be scoped out of the assessment.

Table 3.17

TEL1: SLC agree with the proposed methods to be followed in terms of the establishing the baseline position in respect of this aspect of the overall assessment.

TEL2: SLC agree to the extent of those matters which are to be scoped into the assessment.

TEL3: SLC agree to the extent of those matters that are to be scoped out of the assessment.

Conclusion

Overall, the scope of topics set out within the Scoping Report are considered acceptable by South Lanarkshire Council, subject to the incorporation of the chapter specific advice listed above.

It is again reiterated that this Scoping Response is a technical response in relation to the Scoping Opinion Request and the EIA Regulations and does not provide any advice on the

planning merits or other of the proposals and therefore does not prejudice the outcome of any planning application that may be submitted.

Tony Finn
Area Manager - HQ

Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Colin Abernethy
Energy Consents Unit
Scottish Government

By email only to: Econsents_Admin@gov.scot

Our Ref: PCS-20003909

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

17 December 2024

Dear Colin Abernethy

Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
ECU00006030
Request for scoping opinion for the proposed section 36 application for Watchman Energy Park, comprising up to 16 wind turbines with a maximum tip height of 240m, with a generating capacity greater than 50MW and a battery energy storage system (BESS) with a 50MW storage capacity.
10 km south of Crawford, 7 km south of Elvanfoot and 12 km west of Moffat

Thank you for consulting SEPA for an Environmental Impact Assessment (EIA) scoping opinion in relation to the above development. 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 initial peat probing, peat condition assessment and habitat survey work has been completed and the layout developed further as a result.

Our position and advice, given below, is based on the determining authority ultimately concluding that the proposal is classed as development that could be supported for the purposes of assessment under Policies 5 and 22**,** as defined in National Planning

SEPA
Unit 6
4 Parklands Avenue
Holytown
Motherwell
ML1 4WQ

Tel: 03000 99 66 99
www.sepa.org.uk

Framework 4. If this is not the case, please advise so we can re-consider our position and advice.

Advice for the planning authority / determining authority

To **avoid delay and potential objection** the EIA submission must contain a series of scale drawings of sensitivities, for example peat depth, peat condition, Groundwater Dependent Terrestrial Ecosystems (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, then reduce and then mitigate significant impacts on the environment. We request that the issues covered in Appendix 1 below, 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

1.1 In this case, where much of the proposed development is on peat, we expect the application to be supported by a comprehensive site-specific peat management plan (PMP).

1.2 At section 3.5.15 of the Scoping Report, the applicant proposes to scope out the undertaking of a peatland condition assessment. The condition of peat and / or carbon-rich soils is an important factor in determining whether potential impacts are acceptable. As such, we do not agree with this being scoped out and request that a peat condition assessment is undertaken. Please see section 4.3 of Appendix 1 to this letter for further guidance.

1.3 We note that a National Vegetation Classification (NVC) survey has been carried out, so the information we require in the respect will be presented. As the survey has already been undertaken, it would have been helpful if the results had been included

in the scoping report to allow us to provide more focused pre-application advice. Due to discrepancies in habitat definition and ambiguity in correspondence with types, we do not accept the use of The UK Habitat Classification System (UKHab) as an alternative to NVC.

1.4 At section 3.7.24 of the Scoping Report, the applicant proposes to scope out the assessment of impacts on GWDTE based on further surveys and assessments. Should the results of the further work find that the potential GWDTE features are not dependent on groundwater, then we would not require any further risk assessment.

1.5 At section 3.7.26 of the Scoping Report, the applicant proposes to undertake further work to confirm there are no private water supplies (PWS) which have not already been identified. Provided that proposed development is outwith the relevant buffers from ground water abstractions, we would not require further consideration of impacts in this respect.

1.6 We have recently updated our guidance covering impacts on GWDTE and existing abstractions and new versions will be available on our website from January 2025. Copies of these documents are provided as attachments to the cover email which can be shared with the applicant to aid the EIA process.

1.7 Provided watercourse crossings are designed to accommodate the 1 in 200 year event plus climate change and other infrastructure is located well away from watercourses we do not foresee from current information a need for detailed information on flood risk.

1.8 In direct response to the questions to consultees, we offer the following response:

- ECO2 – Sufficiency of ecological surveys and studies. We ask that a peat condition survey is undertaken to support the assessment of impacts on peat and carbon rich soils.
- HYD1 – Sufficiency of assessment methodology. We generally agree with the proposed assessment methodology but refer the applicant to Appendix 1 of the letter for our minimum information guidance.

- HYD2 – Further consultees / information sources. We have nothing further to add in this respect.
- HYD3 – Scoped out features. Subject to the further surveys / assessments being undertaken to confirm that potential GWDTE features are not groundwater dependent and to rule out the possibility of additional ground water abstraction locations, we agree.

2. Regulatory advice for the applicant

2.1 Details of regulatory requirements and good practice advice, for example in relation to engineering works in the water environment and waste management, 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: lanarkshire@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,
Georgia Burborough
Senior Planning Officer
Planning Service

Ecopy to: colin.abernethy@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

Please note that some of the planning guidance referenced in this response is being reviewed and updated to reflect the National Planning Framework 4 (NPF4) policies. For example the Flood Risk Standing Advice and Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. It still provides useful and relevant information, but some parts may be updated further in the future.

This appendix sets out our minimum information requirements and we would welcome 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. 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

1.1 Each of the drawings requested 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. All drawings must be based on an adequate scale with which to assess the information.

1.2 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, and existing built infrastructure must be re-used or upgraded where possible.

1.3 A comparison of the environmental effects of alternative locations of infrastructure elements may be required.

2. Water environment

2.1 The proposals should demonstrate how impacts on local hydrology have been minimised and the site layout designed to minimise watercourse crossings and avoid

other direct impacts on water features. Measures should be put in place to protect any downstream sensitive receptors.

2.2 The submission must include a set of drawings 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;

c) A map showing the location, size, depths and dimensions of all borrow pits overlain with all lochs and watercourses within 250m and showing a site-specific buffer around each loch or watercourse proportionate to the depth of excavations. The information provided needs to demonstrate that a site specific proportionate buffer can be achieved.

2.3 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. Flood risk

3.1 Advice on flood risk is available at Flood Risk Standing Advice and reference should also be made to Controlled Activities Regulations (CAR) Flood Risk Standing Advice for Engineering, Discharge and Impoundment Activities.

3.2 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.

3.3 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.

4. Peat and peatland

4.1 Where proposals are on peatland or carbon rich soils (CRS), the following should be submitted to address SEPA's requirements in relation to NPF4 Policy 5 to protect CRS and the ecosystem services they provide (including water and carbon storage). Peatland in near natural condition generally experiences low greenhouse gas emissions, is accumulating and may be sequestering carbon, has high value for supporting biodiversity, helps to protect water quality and contributes to natural flood management, irrespective of whether that peatland is designated for nature conservation purposes or not.

4.2 It should be clearly demonstrated that the assessment has informed careful project design and ensured, in accordance with relevant guidance and the mitigation hierarchy in NPF4, that adverse impacts are first avoided and then minimised through best practice.

4.3 The submission should include a series of layout drawings at a usable scale showing all permanent and temporary infrastructure, with extent of excavation required. These plans should be overlaid on the following:

a) Peat depth survey showing peat probe locations, colour coded using distinct colours for each depth category. This must include adequate peat probing information to inform the site layout in accordance with the mitigation hierarchy in NPF4, which may be more than that outlined in the Peatland Survey – Guidance on Developments on Peatland (2017);

b) Peat depth survey showing interpolated peat depths;

c) Peatland condition mapping – the Peatland Condition Assessment photographic guide lists the criteria for each condition category and illustrates how to identify each condition category.

4.4 The detailed series of layout drawings above should clearly demonstrate that development proposals avoid any near natural peatland and that all proposed

excavation is on peat less than 1m deep.

4.5 The layout drawings should also demonstrate that peat excavation has been avoided on sites where this is possible. On other sites where complete avoidance of peat and carbon rich soils is not possible then it should be clearly demonstrated that the deepest areas of peat have been avoided and the volumes of peat excavated have been reduced as much as possible, first through layout and then by design making use of techniques such as floating tracks.

4.6 The Outline Peat Management Plan (PMP) must include:

a) A table setting out the volumes of acrotelmic, catotelmic and amorphous peat to be excavated. These should include a contingency factor to consider variables such as bulking and uncertainties in the estimation of peat volumes;

b) A table clearly setting out the volumes of acrotelmic, catotelmic and amorphous excavated peat: (1) used in making good site specific areas disturbed by development, including borrow pits (quantities used in making good areas disturbed by development must be the minimum required to achieve the intended environmental benefit and materials must be suitable for the proposed use), (2) used in on and off site peatland restoration, and (3) disposed of, and the proposed means of disposal (if deemed unavoidable after all other uses of excavated peat have been explored and reviewed);

c) Details of proposals for temporary storage and handling of peat - Good Practice during Wind Farm Construction outlines the approach to good practice when addressing issues of peat management on site and minimising carbon loss;

d) Suitable evidence that the use of peat in making good areas disturbed by development, including borrow pits, is genuine and not a waste disposal operation, including evidence on the suitability of the peat and evidence that the quantity used matches and does not exceed the requirement of the proposed use. If peat is to be used in borrow pits on site, SEPA will require sections and plans including the phasing, profiles, depths and types of material to be used;

e) Use of excavated peat in areas not disturbed by the development itself is now not a matter SEPA provides planning advice on. Please refer to Advising on peatland, carbon-rich soils and priority peatland habitats in development management | NatureScot 2023, and the Peatland ACTION – Technical Compendium which provides more detailed advice on peatland restoration techniques. Unless the excavated peat is certain to be used for construction purposes in its natural state on the site from where it is excavated, it will be subject to regulatory control. The use of excavated peat off-site, including for peatland restoration, will require the appropriate level of environmental authorisation. Excavated peat will be waste if it is discarded, or the holder intends to or is required to discard it. These proposals should be clearly outlined so that SEPA can identify any regulatory implications of the proposed activities. This will allow the developer and their contractors to tailor their planning and designs to accommodate any regulatory requirements. Further guidance on this may be found in the document Is it waste - Understanding the definition of waste.

5. GWDTE and existing groundwater abstractions

5.1 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.

5.2 A National Vegetation Classification (NVC) survey should be submitted which includes the following information:

a) A set of drawings 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 the

guidance attached to the cover email for further advice and the minimum information we require to be submitted.

5.3 Please note that due to discrepancies in habitat definition and ambiguity in correspondence with NVC types we do not accept the use of The UK Habitat Classification System (UKHab) as an alternative to NVC.

6. Forest removal and forest waste

6.1 If forestry is present on the site, the site layout should be designed to avoid 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.

6.2 The submission must include drawings 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.

7. Pollution prevention and environmental management

7.1 The submission must include a schedule of mitigation, which includes reference to best practice pollution prevention and construction techniques (for example, limiting the maximum area to be stripped of soils and peat at any one time) and regulatory requirements. 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

8.1 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.

8.2 The discarding of materials as waste should be avoided. However, if there is an intention to discard materials then further guidance on this may be found in the document Is it waste - Understanding the definition of waste.

sepa Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

For the future of our environment

Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems

August 2024

Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems

Introduction

This guidance sets out SEPA's expectations for the assessment of impact of developments on Groundwater Dependent Terrestrial Ecosystems (GWDTE). This guidance applies to all developments requiring an Environmental Impact Assessment (EIA) provided any temporary or permanent dewatering abstractions are unlikely to exceed 10 m^3/day[1]. It is intended for developers, local authorities, and determining authorities.

GWDTE are specifically protected under the Water Framework Directive as transposed into Scottish legislation and are considered sensitive receptors. In addition, significant impacts on GWDTE can lead to the associated groundwater body being at less than Good status.

The construction and operation of developments can have adverse impacts on the functioning of GWDTE. The impacts will vary depending on the scale and location of the development as well as on the proximity and sensitivity of the GWDTE. Foundations, borrow pits and linear infrastructure such as roads, tracks and trenches can disrupt groundwater flow. Their construction also removes the protective layers of soil and subsoil making the groundwater below more vulnerable to pollution from leaks or spills.

Dewatering or drainage may change the quantity of groundwater supplying GWDTE. Discharges to ground may change the quality of groundwater. These activities are controlled via The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). See the CAR Practical Guide for further information.

SEPA expect developments and infrastructure to be designed and constructed such that the water environment, including GWDTE, are protected. The applicant should seek to avoid adverse impacts on any GWDTE through the detailed design of the development and by implementing best practice construction techniques. However, SEPA does not offer guidance on the detailed design of infrastructure or prescribe a

[1] If abstractions greater than 10 m^3/day are likely, additional assessment is likely to be required in support of water permitting requirements. Refer to the CAR Practical Guide for more information.

specific method or technique for construction as environmental conditions and engineering constraints will be site-specific and construction techniques will require a tailored approach in order to negate risks to identified sensitive receptors.

SEPA will not provide comment on GWDTE if the potential impacts are all assessed as Low or Unimportant.

The matrix below shows how both the scale of the effects and the importance of the GWDTE must be considered when assessing potential impacts.

		How much is it affected			
		Substantially	Moderately	Slightly	Negligibly or not at all
How important is it	High/important	Major	Major	Medium	Negligible/ no effect
	Moderately important	Major	Medium	Low	Negligible/ no effect
	Low importance	Medium	Low	Low	Negligible/ no effect
	Unimportant	Unimportant effect	Unimportant effect	Unimportant effect	Negligible/ no effect

Factors to be considered when assessing potential effects include:

- Extent
- Magnitude
- Duration, frequency and reversibility
- Likelihood
- Cumulative effects, including both impact interactions and additive impacts and considering both intra- and inter-project effects.

Factors to be considered when assessing the importance of a GWDTE include:

- Notification as a feature on a designated nature conservation site
- The Scottish Biodiversity List, UKBAP, Habitats Directive Annex 1

- Habitat connectivity
- Ecosystem services provided – flood mitigation, baseflow maintenance, carbon storage, nutrient filtration
- Relative extent in Scotland
- Significant decline / unfavourable condition
- Importance for supporting species.

See also the CIEEM Ecological Impact Assessment guidelines ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf (cieem.net).

Roles and responsibilities

Developers are responsible for obtaining the relevant information required to support the impact assessment and for designing and undertaking the site works in accordance with the relevant regulations and published guidance.

The determining authority may be the planning authority or relevant Scottish Government departments (e.g. Energy Consents Unit) depending on the nature of the development.

Planning authorities are required to exercise their functions to secure compliance with the Water Framework Directive and the Groundwater Directive as now applicable to Scotland. This includes functions under the Town and Country Planning (Scotland) Act 1997. This requirement is set out in the Water Environment and Water Services (Scotland) Act 2003 and The Water Environment (Relevant Enactments and Designation of Responsible Authorities and Functions) (Scotland) Order 2011.

SEPA are responsible for assessing groundwater body status and for regulating activities that may impact on the water environment in accordance with CAR.

NatureScot provide advice to determining authorities where there is a potential impact on a qualifying feature of a protected site and/or species with special protection.

Recommended assessment approach

SEPA recommends adopting a phased approach to the assessment of risks to GWDTE, with greater detail being required for higher risk sites or activities. Our recommended approach is summarised below.

SEPA expect the assessments to be undertaken by suitably qualified and experienced hydrogeological and ecological specialists.

The checklist in Appendix A provides a summary of the information required in support of the Environmental Impact Assessment report.

Step 1 Identify any GWDTE features

The relevant buffer zones for GWDTE for all proposed infrastructure (provided expected dewatering rates do not exceed $10m^3$/day) are:

a) 10m radius of all activities;

b) 100m radius of all subsurface activities less than 1m in depth;

c) 250m of all subsurface activities deeper than 1m.

Habitat survey screening for potential GWDTE:

Ecological survey(s) are required to identify whether any GWDTE are present within the above buffer zones.

A Phase 1 habitat survey should be provided unless the developer is already aware that GWDTE are likely to be present. The guidance 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland' may be used to identify wetland types, both within and outwith the site boundary, within the relevant buffer zones as a minimum (for the purpose of micro-siting a wider expanse may be surveyed).

If Phase 1 habitat survey results indicate that there may be relevant habitats present, a National Vegetation Classification (NVC) survey should be provided. A list of NVC communities that may be dependent on groundwater is included in Appendix B. Wetlands containing these communities should be considered to be GWDTE unless further information can be provided to demonstrate this is not the case.

Developers can choose to undertake the NVC survey without a Phase 1 habitat survey should they consider it likely that GWDTE are present within the buffer zones.

NatureScot holds some information on the occurrence of GWDTE, predominantly within designated sites (SSSIs, SPAs and SACs). However, there are non-designated wetlands that include GWDTE that are not listed. To identify non-designated GWDTE, refer to the guidance set out in 'SNIFFER (2009) WFD95 – A Functional Wetland Typology for Scotland'.

Assessing groundwater dependency:

Assessment is required to determine whether the potential GWDTE features identified are likely to be dependent on groundwater, either year around or seasonally.

The interpretation should consider both ecology and hydrogeology. Groundwater dependency should be assessed on a site-specific basis for each potential GWDTE feature identified. Relevant factors include botanical communities present, local ground conditions, topography, and surface drainage. The interpretation should include assessment of the likely rooting depths relative to the water table, including potential seasonal variations. Groundwater dependence should be assumed for the NVC communities listed in Appendix B unless there is clear evidence to the contrary.

Features that are indicative of groundwater dependency include:

- Habitats associated with springs
- Where soils are persistently waterlogged on otherwise well drained steep to moderate slopes, in the absence of surface water sources
- Upper edge of GWDTE is aligned with concave breaks in slope
- Diffuse groundwater emergence is often focused along linear geological features (fractures, faults etc)
- Persistent flow even during dry weather
- Limited variation in temperature
- May be base enriched

If no potential GWDTE features are present in the area of interest, no further risk assessment is required. SEPA will not comment on this topic in our planning response.

Otherwise, proceed to Step 2.

Step 2 Qualitative impact assessment

A conceptual site model (CSM) should be provided as part of the Environmental Statement. This should include interpretation of the hydrogeological setting, including the groundwater flow regime, and the ecological features present. This may be supported, as appropriate, by intrusive ground investigation, groundwater monitoring, or groundwater modelling in addition to topography, properties of the emergent water & the soil, and underlying geology.

Qualitative assessment of the potential impacts to any GWDTE features identified within the relevant buffer zones is required. This should consider the expected extent, magnitude, likelihood, and duration, frequency and reversibility of any potential impacts.

The impact assessment should consider the impacts to each GWDTE feature individually, including any potential cumulative effects if the GWDTE feature is in close proximity to multiple parts of the proposed development.

An iterative approach is recommended, using the impact assessment findings to inform the design process. Consider modifying the development proposals to avoid potential impacts as far as possible (i.e. by moving proposed activities outwith the relevant buffer zones).

If the potential impacts to GWDTE are Low or Unimportant, then no further risk assessment is required and SEPA will not provide comment on this topic in our planning response.

Otherwise, proceed to Step 3.

Step 3 Detailed quantitative risk assessment

Undertake quantitative assessment of the potential effects on the GWDTE.

This is expected to be supported by appropriate characterisation of the ground conditions at both the relevant infrastructure location(s) and the GWDTE(s), plus the pathway(s) in between if appropriate. This will require ground investigation, including groundwater level and quality monitoring.

The hydrogeological assessment should quantify the potential change(s) in groundwater levels or flow regime, and/or groundwater quality. The modelling

approach, input parameters and assumptions should be justified. The hydrogeological modelling predictions should inform the assessment of the ecological risks to the GWDTE.

If the quantitative risk assessment confirms the potential impacts are Major or Medium, then provide details of the site-specific mitigation measures proposed to avoid or offset the potential impacts. The nature of the mitigation measures required will depend on both the development and the GWDTE. Consultation with SEPA, and other relevant stakeholders as appropriate (e.g. NatureScot), may be beneficial when developing site-specific mitigation measures.

Then refine the quantitative risk assessment to confirm whether any residual impacts to GWDTE remain once the proposed mitigation measures are in place.

Monitoring & contingency planning

If the assessment proceeded to Step 3, then monitoring is required to demonstrate the effectiveness of the proposed site-specific mitigation measures developed during Step 3.

A site-specific monitoring plan should be provided. The scope of the monitoring is expected to include **groundwater monitoring (levels and quality)** and **ecological monitoring within the GWDTE**. The monitoring plan should include detailed justification of why the proposed scope is fit for purpose. See Appendix C for further guidance on monitoring.

The monitoring plan is recommended to include:

- Monitoring point locations
- Monitoring suite
- Monitoring frequency
- Overview of the monitoring methods and associated QA/QC procedures that will be implemented to ensure the monitoring results are representative
- Site-specific compliance metrics that will be used to identify whether any adverse impact is likely to be occurring / has occurred
- Contingency plans that will be implemented if adverse impacts are identified. These should include timescales for notification of relevant stakeholders, and for design and implementation of remedial actions.

Baseline monitoring is expected to commence at least 12 months ahead of the development works starting on site. The baseline monitoring requirement may be combined with the site characterisation works required in support of Step 3 provided the site works commence within 2 years of the monitoring dataset being collected.

Monitoring is expected to continue during the construction phase, and for a minimum of 5 years post-construction.

The monitoring results must be regularly analysed and interpreted to identify whether any adverse impacts on the GWDTE have occurred or are likely to occur. Reporting to the Local Authority, and NatureScot if relevant, is expected at the end of the baseline period and then annually thereafter.

If any potential impacts are identified by the monitoring or through other means, the contingency plan should be implemented. Appropriate remedial measures are expected to be implemented within 6 months of the potential impacts being identified.

Appendix A Checklist of supporting information

As a minimum, all applications should include the following supporting information:

1. Plans on a base layer Ordnance Survey topographical map (1:10,000 scale if no potential GWDTE identified within buffer plus also 1:2500 scale if GWDTE are present, 10m contours) including the following information:
    a. All proposed infrastructure, including temporary works;
    b. Details of the spatial extent and depth of all proposed subsurface works;
    c. The relevant buffer zones around the proposed infrastructure (10m for all activities, 100m for subsurface activities <1m deep and 250m for subsurface activities >1m depth);
    d. Water features (rivers, streams, lochs, ponds, ditches, springs, wells, issues, collects, etc.); and
    e. The locations and extents of all potential GWDTE (based on Phase 1 habitat survey) within the relevant buffer zones **OR** alternatively a statement confirming that no potential GWDTE are present within the buffer zones.

Supplementing these plans with cross-sectional drawings is highly recommended.

If any potential GWDTE are identified within the relevant buffer zones (during Step 1), then the following additional supporting information should also be provided:

2. NVC survey data
3. Conceptual site model. All assumptions should be justified.
4. Qualitative risk assessment (Step 2).

If any potentially significant risks to GWDTE are identified (after Step 2), then the following additional supporting information should also be provided:

5. Characterisation of ground conditions for both the relevant infrastructure location(s) and GWDTE(s) (plus pathway(s) in between if appropriate). This will usually include:

    a. Intrusive and/or non-intrusive ground investigation

    b. Groundwater monitoring data, both levels and quality.

    The ground investigation and monitoring should be undertaken in accordance with BS5930:2015+A1:2020. All groundwater level data should be provided both in metres below ground level and in metres above Ordnance Datum. Both factual data and interpretation should be provided. Supplementing the interpretation with appropriate plans and sections is highly recommended. All assumptions should be justified.

6. An updated site plan (see Point 1 above) including groundwater monitoring point locations, groundwater level contours and flow directions.

7. Detailed quantitative risk assessment. Justification should be provided regarding the modelling approach adopted, model input parameters, and all assumptions.

8. Detailed description of proposed mitigation measures to offset any significant residual risks (if applicable). Supplementing this with appropriate plans or drawings is highly recommended.

9. Proposed monitoring plan (if applicable).

Appendix B NVC communities

NVC communities, which if present, indicate that a wetland may be groundwater dependent depending on the hydrogeological setting[2]. Inclusion in the Scottish Biodiversity List as habitats of principle importance for biodiversity conservation in Scotland is shown by a 'Y' in the columns for upland and lowland.

NVC Community	NVC Community Name	Lowland	Upland
M4	*Carex rostrata - Sphagnum fallax* mire	Y	Y
M5	*Carex rostrata - Sphagnum squarrosum* mire	Y	Y
M6	*Carex echinata - Sphagnum recurvum* mire	Y	Y
M7	*Carex curta - Sphagnum russowii* mire	N	Y
M8	*Carex rostrata - Sphagnum warnstorfii* mire	N	Y
M9	*Carex rostrata - Calliergon cuspidatum/C.giganteum* mire	Y	Y
M10	*Carex dioica - Pinguicula vulgaris* mire	Y	Y
M11	*Carex demissa - Saxifraga aizoides* mire	N	Y
M12	*Carex saxatilis* mire	N	Y
M13	*Schoenus nigricans - Juncus subnodulosus* mire	Y	N
M14	*Schoenus nigricans - Narthecium ossifragum*	Y	Y
M15	*Scirpus cespitosus - Erica tetralix* wet heath	Y	Y
M16	*Erica tetralix - Sphagnum compactum* wet heath	Y	Y
M21	*Narthecium ossifragum - Sphagnum papillosum* valley mire	Y	Y
M22	*Juncus subnodulosus - Cirsium palustre* fen meadow	Y	N
M23	*Juncus effusus/acutiflorus - Galium palustre* rush-pasture	Y	Y

[2] 'UKTAG list of NVC communities and associated groundwater dependency scores (2008)' contains a full list for all NVCs with Scotland groundwater dependency scores.

NVC Community	NVC Community Name	Lowland	Upland
M24	*Molinia caeruleae - Cirsium dissectum fen meadow*	Y	Y
M26	*Molinia caerulea - Crepis paludosa* mire	Y	Y
M27	*Filipendula ulmaria - Angelica sylvestris* mire	Y	Y
M28	*Iris Pseudacorus - Filipendula ulmaria* mire	Y	Y
M29	*Hypericum elodes - Potamogeton polygonifolius* soakway	Y	Y
M30	*Hydrocotylo – Baldellion*	Y	Y
M31	*Anthelia julacea - Sphagnum auriculatum* spring	N	Y
M32	*Philonotis fontana - Saxifraga stellaris* spring	N	Y
M33	*Pohlia wahlenbergii* var. *glacialis* spring	N	Y
M34	*Carex demissa - Koenigia islandica* flush	N	Y
M35	*Ranunculus omiophyllus - Montia fontana* rill	Y	Y
M36	Lowland springs and streambanks of shaded situations	Y	N
M37	*Cratoneuron commutatum* springs	N	Y
M38	*Cratoneuron commutatum* springs	N	Y
S2	*Cladium mariscus* swamp and sedge beds	Y	Y
S3	*Carex paniculata* sedge swamp	Y	Y
S7	*Carex acutiformis* swamp	Y	Y
S11	*Carex vesicaria* swamp	Y	Y
S24	*Phragmites australis - Peucedanum palustre* tall-herb fen	Y	N
S25	*Phragmites australis - Eupatorium cannabinum* tall-herb fen	Y	Y
MG4	*Alopecurus pratensis - Sanguisorba officinalis*	Y	N
MG8	*Cynosurus cristatus - Caltha palustris* lowland neutral grassland	Y	Y

NVC Community	NVC Community Name	Lowland	Upland
MG9	*Holcus lanatus - Deschampsia cespitosa* grassland	N	N
MG10	*Holcus lanatus - Juncus effusus* rush-pasture	N	N
MG11	Inland wet grassland, *Festuca rubra-Agrostis stolonifera-Potentilla anserina* grassland	N	N
W1	*Salix cinerea - Galium palustre* woodland	Y	N
W2	*Salix cinerea - Betula pubescens - Phragmites australis* woodland	Y	N
W3	*Salix pentandra - Carex rostrata* woodland	Y	Y
W4	*Betula pubescens - Molinia caerulea* woodland	Y	Y
W5	*Alnus glutinosa - Carex paniculata* woodland	Y	Y
W6	*Alnus glutinosa - Urtica dioica* woodland	Y	N
W7	Residual alluvial forests (*Alnus glutinoso-incanae*)	Y	Y
W20	*Salix lapponum – Luzula sylvatica* scrub	N	Y
CG10	*Festuca ovina – Agrostis capillaris – Thymus praecox* grassland (when not on limestone)	Y	Y
CG11	*Festuca ovina - Agrostis capillaris - Alchemilla alpina* grassland (when not on limestone)	N	Y
CG12	*Festuca ovina – Alchemilla alpina – Silene acaulis* dwarf-herb community	N	Y
U5c	*Nardus stricta-Galium saxatile* grassland *Carex panicea-Viola palustris* sub-community	N	Y
U6	*Juncus squarrosus - Festuca ovina* grassland	N	Y
U15	*Saxifraga aizoides – Alchemilla glabra*	N	Y
U16	*Luzula sylvatica – Vaccinium myrtillus* tall herb community	N	N
U17	*Luzula sylvatica – Geum rivale* tall herb community	N	Y

NVC Community	NVC Community Name	Lowland	Upland
SD13	*Salix repens -Bryum pseudotriquetrum* dune-slack community	Y	N
SD14	*Salix repens -Campylium stellatum* dune-slack community	Y	N
SD15	*Salix repens-Calliergon cuspidatum* dune-slack community	Y	N
SD16	*Salix repens - Holcus Lanatus* dune slack community	Y	N
SD17	*Potentilla anserina-Carex nigra* dune-slack community	Y	N

Appendix C Additional monitoring guidance

Monitoring must provide an evidence base which demonstrates that the construction and operation of infrastructure is proceeding as intended and that it has not resulted in a statistically significant quantitative or qualitative change to groundwater flows or quality that could impact GWDTE.

SEPA recommend the monitoring includes the following as a minimum. Sites with complex hydrogeological settings, multiple or highly sensitive receptors, and/or where high-risk activities are proposed are likely to require considerably more monitoring.

1. **Ecological monitoring**. Condition survey of each relevant GWDTE community or mosaic comprising a minimum of 1 fixed 2m^2 quadrat surveyed to NVC level in accordance with standard methodology (Rodwell, 2006)[3] plus additional fixed-point photography, repeated in years 1, 3 and 5 post-completion. Additional monitoring locations may be required for large or complex sites. The adequacy of the monitoring coverage should be justified. The timing of the survey should be consistent between years and be optimal for species identification. At each GWDTE the total extent of the wetland vegetation, presence and abundance of species using the Domin scale, surface patterning, positive indicator species, plus indicators of negative change and of local distinctiveness must be provided.
2. **At least three groundwater monitoring points per GWDTE** (one upgradient and two downgradient). Additional monitoring points may be required for large or complex sites. The adequacy of the monitoring network should be justified. The groundwater monitoring points may include purpose-built monitoring boreholes, springs, and/or co-opted third party wells if suitable. The groundwater monitoring network may be supplemented by surface water monitoring if appropriate for the hydrogeological setting.
3. **Groundwater level monitoring**. Water levels should be measured to at least 10mm accuracy and the data provided in both metres below ground level and

[3] Rodwell, J.S. (2006). National Vegetation Community Users' Handbook. JNCC, Peterborough.

metres above Ordnance Datum. Flow rates should be monitored at springs. The use of dataloggers to allow more frequent monitoring is highly recommended to better characterise how groundwater levels respond to weather events.

4. **Groundwater quality sampling and analysis**. Appropriate sampling methods should be selected to ensure the water samples are representative and to avoid cross-contamination between monitoring points.
5. **Rainfall monitoring**. Either a site-specific rain gauge should be established or alternatively rainfall data may be sourced from a third-party rain gauge (e.g. SEPA or Met Office) if the location is adequately representative for the site. Rainfall should be measured at least daily.

The monitoring should be designed and undertaken by appropriately qualified and experienced specialists.

Table C1 - Recommended minimum groundwater monitoring frequencies

Monitoring period	Groundwater Levels	Groundwater Quality
Baseline At least 12 months prior to construction commencing	Every ~2 weeks	Monthly
During construction	Monthly	Quarterly
Post-construction At least 5 years	Monthly	Quarterly

The groundwater quality analysis is recommended to include:

- pH, electrical conductivity, dissolved oxygen, redox, temperature (these parameters may be measured in the field)
- Chloride, alkalinity, sulphate,
- Sodium, potassium, calcium, magnesium
- Ammoniacal nitrogen, nitrate, nitrite, orthophosphate
- Total suspended solids
- Dissolved organic carbon
- Other parameters relevant to the activities being undertaken or the hydrogeological setting e.g. hydrocarbons, metals, etc.

The baseline monitoring report is recommended to include:

1. Map showing locations of relevant infrastructure / activities, GWDTE and monitoring points.
2. Details of groundwater monitoring points. This should include geological logs with construction details for all monitoring boreholes, location co-ordinates and datum surveyed in to Ordnance Datum, and photographs.
3. Details of the ecological monitoring points. This should include location co-ordinates and photographs.
4. Description of monitoring methods and associated QA/QC measures.
5. Factual data in electronic format (e.g. Excel or similar). Laboratory certificates should also be provided for the water quality analysis.
6. Interpretation of the data including statistical assessment of any spatial or temporal trends. The use of control charts and piper diagrams is highly recommended.
7. Recommendations for any amendments to the scope of future monitoring.

Subsequent annual monitoring reporting is recommended to include:

1. A summary of monitoring undertaken, including detailed explanation of any amendments or omissions from the agreed scope of monitoring.
2. Factual data in electronic format (e.g. Excel or similar). Laboratory certificates should also be provided for the water quality analysis.
3. Photographs of monitoring points.
4. Interpretation of the data including statistical assessment of any spatial or temporal trends. This should include assessment of whether there are any statistically significant ($P < 0.05$) changes compared with the baseline dataset. The use of control charts and piper diagrams is highly recommended.
5. Summary of any exceedances of agreed compliance metrics.
6. Assessment of whether any significant impacts have occurred or are likely to occur at the GWDTE. This should include interpretation as to the likely reason(s) why this has occurred.
7. Recommendations for any remedial works required to address any issues identified, including any associated additional monitoring. If any of the

remedial actions have been implemented ahead of reporting, a summary of the works undertaken should be provided.

sepa Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

For the future of our environment

Guidance on Assessing the Impacts of Development on Groundwater Abstractions

August 2024

Guidance on Assessing the Impacts of Developments on Groundwater Abstractions

Introduction

This guidance sets out SEPA's expectations for the assessment of impact of developments on groundwater abstractions, both public and private water supplies. This guidance applies to all developments requiring an Environmental Impact Assessment (EIA) provided any temporary or permanent dewatering abstractions are unlikely to exceed 10 m^3/day[1]. It is intended for developers and Local Authorities, and Determining Authorities.

SEPA expect developments and infrastructure to be designed and constructed such that the water environment, including groundwater abstractions, are protected. The applicant should seek to avoid adverse impacts on groundwater abstractions through the detailed design of the development and by implementing best practice construction techniques. The potential for impacts will vary depending on the scale and location of the development as well as on the proximity of the groundwater abstraction. SEPA does not offer guidance on the detailed design of infrastructure or prescribe a specific method or technique for construction as environmental conditions and engineering constraints will be site-specific and construction techniques will require a tailored approach to negate risks to identified sensitive receptors.

Dewatering or drainage may change the quantity of groundwater supplying abstractions. Discharges to ground may change the quality of groundwater. These activities are controlled via The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) as amended. See the CAR Practical Guide for further information.

Note also this guidance does not cover assessment of impacts to existing surface water abstractions or impoundments.

SEPA will not provide comment on potential impacts to private water supplies unless the assessment has progressed to Step 3 (Detailed quantitative risk assessment).

The matrix below shows how both the scale of the effects and the importance of the abstraction must be considered when assessing potential impacts.

		How much is it affected			
		Substantially	**Moderately**	**Slightly**	**Negligibly or not at all**
How Important is it	**High/ Important**	Major	Major	Medium	Negligible/ no effect
	Moderately Important	Major	Medium	Low	Negligible/ no effect
	Low Importance	Medium	Low	Low	Negligible/ no effect
	Unimportant	Unimportant effect	Unimportant effect	Unimportant effect	Negligible/ no effect

Factors recommended to be considered when assessing potential effects include:

- Extent
- Magnitude
- Duration, frequency, and reversibility
- Likelihood
- Cumulative effects, including both impact interactions and additive impacts and considering both intra- and inter-project effects.

When assessing potential importance of groundwater abstractions, SEPA suggest:

- Scottish Water abstractions are assessed as being of High importance
- Private water abstractions for human consumption are likely to be of Moderate importance
- Other non-potable abstractions are likely to be Low to Moderate importance, depending on the purpose of the abstraction.

Roles & Responsibilities

Developers are responsible for obtaining the relevant information required to support the impact assessment and for designing and undertaking the site works in accordance with the relevant regulations and published guidance.

Owners/operators of existing groundwater abstractions are responsible for compliance with the relevant regulations regarding abstraction and water supply and for maintaining their abstraction infrastructure. See the SEPA guidance on good practice for water abstraction boreholes An applicant's guide to water supply boreholes (sepa.org.uk).

The Determining Authority may be the Planning Authority or relevant Scottish Government departments (e.g. Energy Consents Unit) depending on the nature of the development. Planning Authorities are required to exercise their functions to secure compliance with the Water Framework Directive and the Groundwater Directive as now applicable to Scotland. This includes functions under the Town and Country Planning (Scotland) Act 1997. This requirement is set out in the Water Environment and Water Services (Scotland) Act 2003 and The Water Environment (Relevant Enactments and Designation of Responsible Authorities and Functions) (Scotland) Order 2011.

Scottish Water are responsible for provision of public water supplies.
Local Authorities are responsible for assessing private groundwater abstractions used for potable supply in accordance with the Private Water Supplies (Scotland) Regulations 2006.
SEPA are responsible for assessing groundwater body status and for regulating activities that may impact on the water environment in accordance with CAR.

Note that in applying this guidance, SEPA will only consider the groundwater component of abstractions. It is not SEPA's role to protect surface run-off that may directly supply the abstraction or enter the abstraction headworks or associated infrastructure due to poor construction. Advice on the protection of these components of the supply should be sought from the Local Authority.

Recommended assessment approach

SEPA recommends adopting a phased approach to the assessment of risks to groundwater abstractions, with greater detail being required for higher risk sites or activities. Our recommended approach is summarised below.

SEPA expect the assessments to be undertaken by suitably qualified and experienced specialists.

The checklist in Appendix A provides a summary of the information required in support of the Environmental Statement.

Step 1 Identify any existing groundwater abstractions

This covers both public and private water supply groundwater abstractions, both within and outwith the site boundary. **It is critical that it is the actual source of the abstraction, and not the property that it supplies, that is identified**.

The relevant buffer zones for groundwater abstractions for all proposed infrastructure, both temporary and permanent and provided expected dewatering rates do not exceed $10m^3$/day, are:

a) 10m for all activities
b) 100m radius of all subsurface activities less than 1m in depth;
c) 250m of all subsurface activities deeper than 1m.

Scottish Water hold information regarding public water supplies. The Local Authority holds records of private water supplies. Note that the information held by the Local Authority will sometimes relate to the property served by the private water supply, rather than the location of the source itself (e.g. the house rather than the borehole or spring). Therefore, the details of each private water supply source require confirmation, including a site walkover survey.
If there are no groundwater abstractions within the buffer zones, SEPA will not provide comment on this topic in our planning response.

Otherwise, proceed to Step 2.

During the determination process if a stakeholder considers the location of an individual groundwater abstraction has been wrongly assessed during Step 1, this should be raised with the Determining Authority. The Determining Authority will determine whether further information is required from the developer to confirm the exact locations. If this is after the determination process, then the stakeholder should consult with the relevant Planning Authority.

Step 2 Qualitative impact assessment

A conceptual site model (CSM) should be provided as part of the Environmental Statement. This should include interpretation of the hydrogeological setting, including the groundwater flow regime. This may be supported, as appropriate, by intrusive ground investigation, groundwater monitoring, or groundwater modelling.

Qualitative assessment of the potential impacts to any groundwater abstractions identified within the relevant buffer zones is required. This should consider the expected extent, magnitude, likelihood, and duration, frequency, and reversibility of any potential impacts.

The impact assessment should consider the impacts to each groundwater abstraction individually, including any potential cumulative effects if the groundwater abstraction is near multiple parts of the proposed development.

An iterative approach is recommended, using the impact assessment findings to inform the design process. Consider modifying the development proposals to avoid significant risks as far as possible (i.e. by moving proposed activities outwith the relevant buffer zones).

If the potential impacts to groundwater abstractions are Low or Unimportant, then no further risk assessment is required. SEPA will not provide comment on this topic in our planning consultation response.

Otherwise, proceed to Step 3.

During the determination process, if a stakeholder does not agree with the impact assessment findings after Step 2, this should be raised with the Determining Authority. The Determining

Authority will determine whether further information or assessment is required, including whether to escalate the assessment to Step 3. If this is after the determination process, then the stakeholder should consult with the relevant Planning Authority.

Step 3 Detailed quantitative risk assessment

Undertake detailed quantitative risk assessment (DQRA) to determine the potential effects on the groundwater abstractions within the buffers.

The DQRA is expected to be supported by appropriate characterisation of the ground conditions at both the relevant infrastructure location(s) and the groundwater abstraction(s), plus the pathway(s) in between if appropriate. This will require ground investigation, including groundwater level and quality monitoring.

The DQRA should quantify the potential change(s) in groundwater levels or flow regime. The modelling approach, input parameters and assumptions should be justified. The hydrogeological modelling predictions should inform the assessment of the risks to the groundwater abstractions.

If the DQRA confirms the potential impacts are Major or Medium, then provide details of the site-specific mitigation measures proposed to avoid or offset the potential impacts. The nature of the mitigation measures required will depend on both the development and the groundwater abstractions.

Then refine the DQRA to confirm whether any residual impacts to the groundwater abstractions remain once the proposed mitigation measures are in place.

Monitoring & contingency planning

If the DQRA during Step 3 confirmed there are potential impacts to groundwater abstractions, then SEPA recommend monitoring of the relevant abstractions is undertaken to demonstrate the effectiveness of the proposed site-specific mitigation measures.

The developer or Determining Authority may choose to widen the scope of the monitoring further to include monitoring of all abstractions within the buffers.

A site-specific monitoring plan should be provided. The scope of the monitoring is expected to include groundwater monitoring (levels and quality) and monitoring at the groundwater abstractions. The monitoring plan should include detailed justification of why the proposed scope is fit for purpose. See Appendix B for further guidance on monitoring.

The monitoring plan is recommended to include:

- Monitoring point locations
- Monitoring suite
- Monitoring frequency
- Overview of the monitoring methods and associated QA/QC procedures that will be implemented to ensure the monitoring results are representative
- Site-specific compliance metrics that will be used to identify whether any adverse impact may be occurring /has occurred
- Contingency plans that will be implemented if adverse impacts are identified. These should include timescales for notification of relevant stakeholders, and for design and implementation of remedial actions.

Baseline monitoring is expected to commence at least 12 months ahead of the development works starting on site.

Monitoring is expected to continue during the construction phase, and for a minimum of 12 months post-construction.

The monitoring results must be regularly analysed and interpreted to identify whether any significant adverse impacts on the groundwater abstractions have occurred or are likely to occur.

The monitoring results should be reported to the Local Authority and the owner/operator of the existing abstractions. Reporting is expected at the end of the baseline period and then annually thereafter. **There is no requirement to routinely submit the monitoring data to SEPA. SEPA will not review the monitoring data unless the Local Authority has identified specific issues of significant concern.**

If any potential impacts are identified by the monitoring or through other means, the contingency plan should be implemented. Appropriate remedial measures are expected to be implemented as soon as possible if adverse impacts are identified.

Contingency plans involving the temporary or permanent replacement of a groundwater supply to provide security of supply (e.g. provision of a new borehole or connection to public supply) must be agreed with the owner /operator of the abstraction. **SEPA will not comment on the alteration or the provision of alternative supplies, the acceptance of which can only be agreed between the developer and the supply owner.**

Appendix A Checklist of supporting information

As a minimum, all applications should include the following supporting information:

1. Plans on a base layer Ordnance Survey topographical map (1:10,000 scale if no groundwater abstractions identified within buffer plus also 1:2500 scale if groundwater abstractions are present, 10m contours) including the following information:
    a. All proposed infrastructure, including temporary works;
    b. Details of the spatial extent and depth of all proposed subsurface works;
    c. The relevant buffer zones around the proposed infrastructure (100m for subsurface activities <1m deep and 250m for subsurface activities >1m depth);
    d. Water features (rivers, streams, lochs, ponds, ditches, springs, wells, issues, collects, etc.); and
    e. The locations of all groundwater abstractions within the relevant buffer zones **OR** alternatively a statement confirming that no groundwater abstractions are present within the buffer zones.

Supplementing these plans with cross-sectional drawings is highly recommended.

If any groundwater abstractions are identified within the relevant buffer zones (during Step 1), then the following additional supporting information should also be provided:

2. Details of the existing groundwater abstractions, including:

    a. Source type (e.g. borehole, well, spring, etc)
    b. Logs / construction details of the abstraction source and associated infrastructure.
    c. Photograph(s) of abstraction source and associated headworks and infrastructure
    d. Water usage (e.g. potable supply, irrigation, industrial supply, etc); and
    e. Abstraction rates.

3. Conceptual site model. All assumptions should be justified.

4. Qualitative risk assessment (Step 2).

If any potentially significant risks to groundwater abstractions are identified (after Step 2), then the following additional supporting information should also be provided:

5. Characterisation of ground conditions for both the relevant infrastructure location(s) and groundwater abstraction(s) (plus pathway(s) in between if appropriate). This will usually include:
    a. Intrusive and/or non-intrusive ground investigation
    b. Groundwater monitoring data, both levels and quality.

    The ground investigation and monitoring should be undertaken in accordance with BS5930:2015+A1:2020. All groundwater level data should be provided both in metres below ground level and in metres above Ordnance Datum. Both factual data and interpretation should be provided. Supplementing the interpretation with appropriate plans and sections is highly recommended. All assumptions should be justified.

6. An updated site plan (see Point 1 above) including groundwater level contours and flow directions.

7. Detailed quantitative risk assessment. Justification should be provided regarding the modelling approach adopted, model input parameters, and all assumptions.

8. Detailed description of proposed mitigation measures to offset any significant residual risks (if applicable). Supplementing this with appropriate plans or drawings is highly recommended.

9. Proposed monitoring plan (if applicable).

Appendix B Additional monitoring guidance

Monitoring must provide an evidence base which demonstrates that the construction and operation of infrastructure is proceeding as intended and that it has not resulted in a statistically significant quantitative or qualitative change to groundwater flows or quality that could impact the groundwater abstractions.

The monitoring should be designed and undertaken by appropriately qualified and experienced specialists.

SEPA recommend the monitoring includes the following as a minimum. Sites with complex hydrogeological settings, multiple or highly sensitive receptors, and/or where high-risk activities are proposed are likely to require considerably more monitoring.

1. **Each groundwater abstraction within the buffer zones** set out in Step 1.
2. **Groundwater level monitoring**. Water levels should be measured to at least 10mm accuracy and the data provided in both metres below ground level and metres above Ordnance Datum. Records should specify whether readings are representative of pumped or rest conditions. Flow rates should be monitored at springs. The use of dataloggers to allow more frequent monitoring is highly recommended to better characterise how groundwater levels respond to weather events.
3. **Groundwater quality sampling and analysis**. Appropriate sampling methods should be selected to ensure the water samples are representative and to avoid cross-contamination between monitoring points. Monitoring raw water quality is recommended.
4. **Rainfall monitoring**. Either a site-specific rain gauge should be established or alternatively rainfall data may be sourced from a third-party rain gauge (e.g. SEPA or Met Office) if the location is adequately representative for the site. Rainfall should be measured at least daily.

Additionally, SEPA consider it beneficial for the developer to also monitor additional locations between the development and the groundwater abstraction. These may include purpose-built monitoring boreholes, springs, and/or co-opted third party wells if suitable. Additionally, the groundwater monitoring network may be supplemented by surface water monitoring if appropriate for the hydrogeological setting.

Recommended minimum groundwater monitoring frequencies:

- **Baseline** – monthly for at least 12 months prior to construction commencing
- **During construction** – fortnightly whilst works are ongoing within the relevant buffers
- **Post construction** – monthly for at least 12 months

The water quality monitoring suites are recommended to include:

- pH, electrical conductivity, dissolved oxygen, redox, temperature (these parameters may be measured in the field)
- Chloride, alkalinity, sulphate
- Sodium, potassium, calcium, magnesium
- Ammoniacal nitrogen, nitrate, nitrite, orthophosphate
- Biological oxygen demand, chemical oxygen demand
- Iron, manganese (total and dissolved)
- Total suspended solids
- Dissolved organic carbon
- Colour, turbidity, taste, odour
- Other parameters relevant to the activities being undertaken or the hydrogeological setting e.g. hydrocarbons, metals, etc.

The **baseline monitoring report** is recommended to include:

1. Map showing locations of relevant infrastructure / activities, groundwater abstractions, and monitoring points.
2. Details of monitoring points. This should include logs / construction details, location co-ordinates and datum surveyed in to Ordnance Datum, and photographs.
3. Description of monitoring methods and associated QA/QC measures.
4. Factual data in electronic format (e.g. Excel or similar). Laboratory certificates should also be provided for the water quality analysis.
5. Interpretation of the data including statistical assessment of any spatial or temporal trends. The use of control charts[1] is highly recommended.

6. Recommendations for any amendments to the scope of future monitoring.

Subsequent **annual monitoring reporting** is recommended to include:

1. A summary of monitoring undertaken, including detailed explanation of any amendments or omissions from the agreed scope of monitoring.
2. Factual data in electronic format (e.g. Excel or similar). Laboratory certificates should also be provided for the water quality analysis.
3. Photographs of monitoring points.
4. Interpretation of the data including statistical assessment of any spatial or temporal trends. This should include assessment of whether there are any statistically significant ($P < 0.05$) changes compared with the baseline dataset. The use of control charts is highly recommended.
5. Summary of any exceedances of agreed compliance metrics.
6. Assessment of whether any significant impacts have occurred or are likely to occur at the groundwater abstractions. This should include interpretation as to the likely reason(s) why this has occurred.
7. Recommendations for any remedial works required to address any issues identified, including any associated additional monitoring. If any of the remedial actions have been implemented ahead of reporting, a summary of the works undertaken should be provided.

The monitoring results should be reported to the Local Authority and the owner/operator of the existing abstractions. **There is no requirement to submit the monitoring data to SEPA. SEPA will not review the monitoring data unless the Local Authority has identified specific issues of significant concern.**

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

Colin Abernethy
Case Manager
Energy Consents Unit
Scottish Government

By email only to: Econsents_Admin@gov.scot

Your Ref: ECU00006030
Our Ref: CEA178350
Date: 10 January 2025

Dear Mr Abernethy,

Electricity Act 1989
The Electricity Works (Environment Impact Assessment) (Scotland) Regulations 2017
Request for scoping opinion for proposed section 36 application for Watchman Energy Park

Thank you for your consultation dated 4 December 2024 on the scope of the Environmental Impact Assessment (EIA) for the proposed Watchman Energy Park, and the link to all related documents. Our advice is based on the EIA Scoping Report (Ramboll, 11 September 2024) and subsequent EIA maps.

1. Summary

Key natural heritage considerations requiring consideration within the EIA are:

- Potential impact on Shiel Dod Site of Special Scientific Interest (SSSI);
- Potential impacts on Golden Eagles;
- Potential impacts on rare freshwater fish, vendace;
- Potential impacts on carbon-rich soil and priority peatland habitats; and
- Landscape and visual impacts, including cumulative impacts.

2. Background

2.1. The applicant, Watchman Energy Park Limited, seeks a scoping opinion for an EIA, proposing to construct and operate a wind farm and associated infrastructure including a Battery Energy Storage System (BESS), on land located approximately 10 km south of Crawford.

5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU
5 Cidhe a' Chuain Siar, 150 Broomielaw, Glaschu, G2 8LU
01463 725000 nature.scot
NatureScot is the operating name of Scottish Natural Heritage

2.2. The site is anticipated to accommodate up to 16 wind turbines with a maximum tip height of 240 m and with a generation capacity of over 50 Megawatts. The BESS, and associated infrastructure, including access tracks, site entrance and borrow pits, will be developed once turbine layout has been established.

3. Scoping advice

3.1. In addition to the detailed advice given below, the applicant should refer to our pre-application advice for onshore wind farm proposals on our website[1]. This provides guidance on the issues that developers and their consultants should consider for wind farm developments and includes information on recommended survey methods, sources of further information and guidance and data presentation. Attention should be given to the full range of advice included in the guidance, which sets out our expectations of what should be included in the Environmental Impact Assessment Report (EIAR). The recent update to the guidance encompasses, for example, advice on expectations for peatland restoration, biodiversity enhancement, etc. Where relevant we have discussed our pre-application guidance advice below.

Designated sites

Shiel Dod Site of Special Scientific Interest

3.2. The application area overlaps with the Shiel Dod SSSI, designated for its upland habitat[2]. According to the Scoping Report we understand that no turbines, or any other development, are to be situated within the SSSI. While we agree that only turbines 15 and 16 of the current proposed layout may have an effect on the SSSI due to the potential connectivity of watercourses feeding into the designated site and potential for pollution impacts, we also advise that potential effects during the operational phase of the wind farm should also be scoped in to the EIAR.

3.3. Also, due to the unknown locations of associated infrastructure, including access tracks, we do not think that assessment of construction and operational phases should be scoped out at this point with regards to associated infrastructure. We would be happy to advise further once the locations of associated infrastructure is available.

Landscape and Visual Impacts

3.4. The proposed development would be located within the southern part of the South Lanarkshire Council Leadhills and Lowther Hills Special Landscape Area (SLA), and there are no apparent operational, consented or application wind farms within this SLA. The high sensitivity of nearby landscapes is reflected by other local landscape designations including the Dumfries and Galloway Council Thornhill Uplands Regional Scenic Area (RSA) approximately 700 m west of the site and the Moffat Hills Regional Scenic Area (RSA) approximately 8.3 km east of the proposed development.

3.5. Tala Hart Wild Land Area is located approximately 11.5 km to the northeast of the proposed site. We agree with the applicant that a Wild Land Impact Assessment is not required given the intervening distance, existing presence and influence of other operational wind farms, and consideration of NPF4 Policy 4g. However, given that the applicant proposes to scope in consideration of effects of the proposed development on the Moffat Hills Regional Scenic Area (RSA), we advise that it would be beneficial to look at Wild Land Area qualities in relation to the

[1] NatureScot pre-application guidance for onshore windfarms
[2] SiteLink – Shiel Dod SSSI

RSA. Guidance is available on our website for assessing landscape impacts in relation to wind farms[3] and there is also some guidance on assessing impacts of aviation lighting[4].

Carbon-rich soil and priority peatland habitats

3.6. In addition to our pre-application guidance, our detailed advice for applicants is contained in our revised guidance on Advising on peatland, carbon-rich soils and priority peatland habitats in development management[5] (November 2023).

Golden Eagles

3.7. We welcome the intention to undertake consultation with the South of Scotland Golden Eagle Project (SSGEP) as part of the desk study for the proposed development. Potential impact on birds associated with this project is likely to be a key consideration for this proposal and one which could result in an objection from NatureScot if any significant impacts identified cannot be adequately avoided, mitigated or compensated.

3.8. As such, we do not agree with the proposal to scope golden eagle out of assessment in the EIAR at this stage. To assist with the preparation of the EIAR, we would be pleased to discuss with the applicant how any relevant information received from the SSGEP should be considered in the assessment, for both the proposal alone and in-combination, once this has been obtained by the applicant.

Vendace

3.9. Vendace, Britain's rarest freshwater fish and a species given full protection through inclusion on Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), were translocated to Daer reservoir in the mid-1990s and have become established in small numbers. They are highly susceptible to declines in water quality, increased siltation and de-oxygenation[6]. The presence of Vendace in the reservoir should be fully factored into the design of the development and proposals for pollution prevention and monitoring of fish populations/water quality before, during, and after development presented in the EIAR.

American Signal Crayfish

3.10. A key potential threat to vendace and wider fish populations in this area is the presence of the highly invasive and non-native North American signal crayfish in the surrounding landscape. Their presence has been confirmed in watercourses immediately downstream of Daer reservoir. They are very resilient and will voluntarily leave the water to travel over land in search of food or a new habitat. A specific North-American signal crayfish biosecurity plan should be included as part of the submission for consent. This should detail how the presence or continuing absence of the species during the construction phase will be monitored and set out details of working methods designed to avoid accidental transference of the species, should it be present or become established, a) between watercourses in the same catchment, and b) between catchments. Such measures may include, but not be limited to, visual inspections of clothing, equipment and plant,

[3] NatureScot Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy developments
[4] Guidance on Aviation Lighting Impact Assessment
[5] https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management
[6] Vendace and powan

disinfecting clothing, equipment and plant with a disinfectant such as 'Virkon' and using avoiding any cross-catchment movement from the Clyde. More information is available on SEPA's website[7].

Birds in the Wider Countryside

3.11. We are widely supportive of the surveys conducted thus far and the intention to work closely with local raptor groups and RSPB Scotland. We encourage construction to take place outside of the breeding bird season (March-August) but where this is not possible we advise that a Breeding Bird Protection Plan be in place.

4. Concluding Remarks

Please note that while we support the principle of renewable energy, our advice is given without prejudice to a full and detailed consideration of the impacts of the proposal if submitted as a formal application as part of the EIA or planning process. This advice is provided by NatureScot, the operating name of Scottish Natural Heritage. We hope that you will find it helpful in your consideration of this application. However, should you require any further information or advice from us, please do not hesitate to contact hannah.linton@nature.scot.

Yours sincerely,

Hannah Linton
Operations Officer
West Central

[7] SEPA – Biosecurity and management of invasive non-native species for construction sites and Controlled Activities

Annex 1- NatureScot responses to Scoping Report questions

Questions to consultees – Landscape and Visual Amenity

Do consultees agree with the extent of the Study Areas proposed?
Given the 240 m blade tip height of the proposed turbines we request a minimum 20 km study area for consideration of all landscape and visual effects including cumulative effects.

Are consultees content with the proposed methodology for the LVIA?
We agree with the proposed methodology.

Are consultees content with the proposed approach to undertaking viewpoint photography and preparing visualisations?
We consider that night-time lighting affects both landscape character and visual receptors in line with the jointly drafted Guidance on Aviation Lighting Impact Assessment.

Are consultees content with the proposed viewpoints identified in Table 3.4, and could they advise of any additional viewpoints they consider necessary to assess the effects of the Proposed Development or indeed any that you think are not required?
We have no further requests.

Are consultees content with the proposed approach to the cumulative assessment and could they advise of any specific cumulative sites they consider should be included in the assessment?
We consider that South Lanarkshire, Scottish Borders, Dumfries & Galloway and East Ayrshire Councils are best placed to advice.

Do consultees agree that there are unlikely to be significant effects from decommissioning of the Proposed Development and accordingly this will be scoped out of the LVIA?
We consider that effects during decommissioning are likely to be similar to those of construction.

Questions to consultees – Ecology

Are there any other relevant consultees who should be consulted, or other sources of information that should be considered?
Local raptor study groups and South of Scotland Golden Eagle Project.
Regarding American signal crayfish biosecurity and monitoring water quality, we suggest that you consult with Scottish Water and Clyde River Foundation, who have previously studied the presence of American signal crayfish in the area.

Do consultees agree that the suite of field surveys in addition to a desk study are sufficient to inform a robust impact assessment?
We agree with the proposed suite of field surveys

Do consultees agree that the methodology and scope of assessment is appropriate?
We agree with the proposed methodology. We advise that Vendace are scoped into further assessment, and with this proposals for pollution prevention and monitoring of fish populations/water quality before, during, and after development presented in the EIAR.

Do consultees agree with the features proposed to be scoped out from further assessment as detailed in Table 3.8?
We advise that, due to the location of the SSSI in the application area and the unknown elements of associated infrastructure and access layouts, the impacts of the operational phase on the designated site should not be scoped out.

Impacts on wild deer during the operational phase should not be scoped out - please see the section on 'Wild deer' in the pre-application guidance referenced in the letter, and guidance on what to consider and include in deer assessments and management at development sites[8].

Impacts on resident fish should also not be scoped out during the operational phase given the presence of Vendace in the Daer reservoir.

Questions to consultees – Ornithology

Do consultees agree that the range of ornithology surveys carried out are sufficient and appropriate?
Yes although with the addition of surveys for Golden Eagle

Do consultees agree that the survey areas and buffers adopted for each ornithology survey are appropriate?
Yes – although we are happy to discuss appropriate survey areas and buffers following consultation with South of Scotland Golden Eagle Network.

Are there any other relevant consultees who should be consulted, or other sources of available information that should be considered?
Local raptor groups, RSPB, and South of Scotland Golden Eagle Network.

Do consultees agree with the features / impacts proposed to be scoped out from further assessment?
We do not agree that Golden Eagle are scoped out of further assessment

[8] Planning for development: What to consider and include in deer assessments and management at development sites

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

By email: Econsents_Admin@gov.scot

Colin Abernethy
Energy Consents Unit
4th Floor, 5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Enquiry Line: 0131-668-8716
HMConsultations@hes.scot

Our case ID: 300077056
Your ref: ECU00006030
21 February 2025

Dear Colin Abernethy

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, Watchman Energy Park, South Lanarkshire - EIA scoping

Thank you for consulting us on this Environmental Impact Assessment (EIA) scoping report, which we received on 04 December 2024. 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.

The relevant local authority archaeological and cultural heritage advisors will also be able to offer advice on the scope of the cultural heritage assessment. This may include topics covered by our advice-giving role, and also other topics such as unscheduled archaeology, category B and C listed buildings, and conservation areas.

Proposed development

We understand that the proposed development comprises the construction and operation of a windfarm and Battery Energy Storage System (BESS) located approximately 10km south of Crawford and 7km south of Elvanfoot, South Lanarkshire. The proposed development comprises up to 16 turbines with a maximum tip height of up to 240m, and associated infrastructure and permanent access tracks.

Scope of assessment

We welcome that cultural heritage & archaeology has been scoped into the assessment. We recommend that the applicant refers to the EIA Handbook for best practice advice on assessing cultural heritage impacts. We have identified the potential for significant impacts on our historic environment interests.

Our advice on the nature of these impacts, and any potential mitigation measures, are included in an annex to this covering letter. This also includes our requirements for information to be included in the EIA report.

Further information

Decisions that affect the historic environment should take the Historic Environment Policy for Scotland (HEPS) into account as a material consideration. HEPS is supported by our Managing Change guidance series.

We hope this is helpful. If you would like to submit more information about this or any other proposed development to us for comment, please send it to our consultations mailbox, hmconsultations@hes.scot. If you have questions about this response, please contact Kevin Mooney at kevin.mooney@hes.scot.

Yours sincerely

Historic Environment Scotland

ANNEX

We welcome that potential impacts on cultural heritage & archaeology are scoped into the EIA report, however we have a number of comments to make on assets we consider have the potential to experience significant impacts. There are no category A listed buildings, Inventory battlefields or world heritage sites within the proposed development boundary. At this early stage with the limited information provided by the Zone of Theoretical Visibility (ZTV), this response highlights our concerns surrounding a number of assets that may experience moderate or significant impacts as a result of the proposed development.

Physical impacts

There is a single scheduled monument located within the proposed development boundary that has the potential for direct and indirect physical impacts:

- **Smithwood, bastle house 900m SW of Daerside** (Scheduled Monument SM5647)

No information regarding access tracks or other infrastructure has been provided at this stage and there is therefore the potential for physical impacts on this scheduled monument from these elements of the development. The monument occupies a very large proportion of the narrow section of the development area running north towards Wintercleuch. It may be difficult to incorporate any development in this area without directly impacting the monument. We expect a commitment from the applicant to prevent any damage to this asset and to ensure it is not subject to adverse effects through construction activity. It may also be necessary to consider indirect physical impacts to the fabric of these assets from construction effects such as vibration or dewatering.

Please note that any physical impacts on this asset will require Scheduled Monument Consent (SMC) as administered by HES and that based on the current information, we would be unlikely to grant consent for works within the scheduled area. Any direct impacts to this asset without SMC would be likely to trigger our Compliance Procedures.

Setting impacts

We recommend that heritage assets should selected for detailed analysis using detailed ZTV analysis. We expect all nationally designated assets within the ZTV to undergo an initial assessment to determine the potential for effects to their setting. This assessment should demonstrate a full appreciation of the setting of each heritage asset where potentially significant impacts are identified. This consideration should recognise that impacts may occur on views from, towards or across individual heritage assets as well as from potential changes to their experience. Our Managing Change guidance note on Setting provides further detail on this matter.

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. **SC045925**
VAT No. **GB 221 8680 15**

While we expect all nationally designated sites to be considered within the EIA process, we recommend that any assessment should pay particular attention to the potential for impacts on the settings of the heritage assets listed below. This list is not exhaustive, it simply highlights those assets where we consider there is an obvious risk of significant setting impacts.

Drumlanrig Castle, Outbuildings and Pavilion Blocks Piers, Balustrades and Quadrant Walls and Garden Urns
Category A Listed Building (LB3886)
Drumlanrig Castle
Inventory Garden & Designed Landscape (GDL00143)

These nationally important heritage assets are located approximately 10km to the southwest of the proposed development and within the submitted ZTV. The Lowther Hills, where the proposed development would be located, form an important backdrop to views north and north-east from both the castle and the formal terraced gardens which immediately surround the castle. We welcome the proposal to produce a visualisation showing the predicted view from Drumlanrig Castle itself. It would be helpful if this photomontage could be taken from the elevated main entrance to the Castle at the head of the horseshoe stair and balustraded terrace, which provide elevated panoramic views in the direction of the proposed development.

There are important longer views towards the Castle in its designed landscape setting from the south-west, in which the proposed development may also be visible. We would also request a visualisation showing the proposed development from such a location to help in assessing the impact of the proposed development on the setting of the Castle and its designed landscape.

Smithwood, bastle house 900m SW of Daerside
Scheduled Monument (SM5647)

The monument consists of the remains of a narrow rectangular dwelling which has been identified through fieldwork as a bastle house, a type of fortifed farmhouse dating from the late 16th or early 17th century. The main aspect of the setting of the bastle house is its relationship with the more open agricultural land surrounding it, particularly the area to the north towards the Dear Water. However, the close proximity of the proposed turbines has the potential to dominate the experience of being at the monument. We welcome the proposal to produce a photomontage of the view from this monument towards the development.

Questions for consultees

Is the proposed assessment methodology, including proposed Study Areas, accepted?

Generally we do not consider that a study area based on simple distance is an appropriate methodology for identifying assets for assessment as this risks missing assets at further distances which have particularly sensitive settings. We recommend that a wide ZTV is used in the first instance to establish which assets should be assessed.

We would note however, that even where a detailed ZTV indicates that no intervisibility would be possible from any such assets identified, the potential may remain for turbines to appear in the background of key views towards these assets, and this should be considered as part of the assessment. However, we note and welcome the statement in paragraph 3.4.30 that a ZTV will be used to identify assets beyond the proposed 10km study boundary.

Are there any additional assets beyond the proposed Study Areas that consultees consider significant effects are likely to occur?

No assets have been referenced within the scoping report. The applicant's cultural heritage experts should provide this information in the first instance through an initial assessment. Once this exercise has been undertaken, the subsequent setting assessment will allow them to identify the potential for significant adverse impacts on assets. We would be happy to provide comments on the outputs of such an assessment.

Given the scale of the turbines and the high visibility of the development demonstrated on the ZTV, designated assets with long-distance views which may contribute to their settings and thus to their cultural significance, should be included and we would recommend that the applicants consideration of these and the reasons for scoping them in/out of further assessment should be included in the EIA report.

The Smithwood, Bastle House 900 m south-west of Daerside (SM 5647) has been identified as an asset for a photomontage visualisation. Are there any additional assets for which consultees would like to see visualisations?

We advise that visualisations should be provided for any asset where a significant effect is identified. At this stage we therefore suggest that visualisations are likely to be required for those monuments where the potential for moderate or significant effects is identified. Where initial assessment identifies potential significant impacts on an asset, we recommend that wireframe visualisations should be produced to help analyse the impacts. If impacts are identified as significant, photomontages should be prepared to illustrate these impacts.

Historic Environment Scotland – Longmore House, Salisbury Place, Edinburgh, EH9 1SH
Scottish Charity No. **SC045925**
VAT No. **GB 221 8680 15**

A67

If wireframes can be provided at an early stage this would assist both with the identification of significant effects and the scoping out of any monuments where significant effects are not likely, as well as identifying if potential mitigation by design is possible. It would also assist with identifying whether wireframes will be sufficient for the detailed assessment of impacts or whether photomontages would be required. We would be happy to discuss this in more detail as the EIA proceeds.

Historic Environment Scotland
21/01/2025

A68

Patron His Majesty The King

Bringing horses and people together

The British Horse Society Scotland
Suite A3
Stirling Agricultural Centre
Stirling FK9 4RN

Email catriona.davies@bhs.org.uk
Website www.bhs.org.uk
Tel 02476 840749
Mob 07757 258712

By email to: Econsents_Admin@gov.scot

13th December 2024

Dear Sir/Madam,

Re: Request for scoping opinion for proposed Watchman Energy Park ECU00006030

Thank you for the opportunity to respond to this request for scoping opinion. The British Horse Society (The BHS) represents the interests of the 3.4 million people in the UK who ride or who drive horse-drawn vehicles and is the largest and most influential equestrian charity in the UK. The BHS is committed to protecting and promoting the interests of all horses and the people who care for them through our work in education, welfare, safety and access.

Recreation and tourism
Access to safe off-road riding routes is vital to the health and wellbeing of horses and their riders. Under the terms of the Land Reform (Scotland) Act 2003, equestrians have the same rights of access to the outdoors as other non-motorised users, such as pedestrians and cyclists. Equestrian use should therefore be included when planning and designing wind farm proposals. Considering all access takers, including equestrians, in the early stages helps to avoid problems down the line and ensures that projects like this are an opportunity to preserve and improve access for all, rather than curtail it or restrict it to certain groups.

Scotland's equestrian industry is worth over £300 million to the Scottish economy annually. This figure excludes the value of the horse racing industry, which is worth a further £300 million. South Lanarkshire and the adjoining areas of Dumfries and Galloway and Scottish Borders, are areas of high horse ownership, and equestrianism and equestrian tourism are an important part of the rural economy.

I am there for very disappointed to note that the applicant proposes to scope socio-economics, recreation and tourism out of the EIAR. They do propose a separate Socio-Economic and Tourism Report but outdoor access and recreation are not included in proposed content.

The applicant does note that the Southern Upland Way, a designated core path and one of Scotland's Great Trails (www.scotlandsgreattrails.com) passes through the site. In addition, South Lanarkshire's Core Path Plan shows other routes passing through the site which, whilst not designated as core paths, are likely to be rights of way and are important parts of the wider path network.

Forestry tracks and hills tracks, like those found within and close to the site are often ideal routes for equestrians, as well as other non-motorised access users. Consideration should therefore be given to how access will be managed both during the construction phase and when the wind farm is operational. The creation of new tracks and upgrading of existing ones within wind farms can be an opportunity to improve outdoor access and provide the local community with additional amenity, especially if tracks can offer circular routes for walkers, cyclists, horse riders and others. Obstructions to access like cattle or deer grids and locked gates with no side gate should be avoided. The BHS is here to help and can provide guidance on suitable surfaces and infrastructure to accommodate equestrians and other access takers. We would be very willing to work with the applicant on these aspects.

I strongly advise the applicant to properly consider outdoor access and to produce and Access Management Plan to accompany their application.

Traffic and transport
Access to safe off-road riding routes is vital to the health and wellbeing of horses and their riders. Equestrian road users are classed as vulnerable as they are more likely to be involved in a road accident and more likely to suffer the worst consequences.

Most riding accidents happen on minor roads and with increasing numbers of horses and riders seeking to access the countryside, adequate access to off-road riding should be a priority, especially in rural and semi-rural areas, and areas of high horse ownership, like South Lanarkshire and the adjoining areas of Dumfries and Galloway and Scottish Borders. Few riders access busy roads by choice (although the horse has as much right to be on public roads as cars, bikes and pedestrians) - but they often have few other places to ride or no other way to access their safe off-road riding. Vehicles travelling two and from the site are likely to meet equestrians on the road and drivers should be advised of this risk. I have enclosed a copy of our *"Guidance to drivers of large vehicles"* document.

I strongly advise the applicant to produce a Construction Traffic Management Plan. This should include a clear plan of how vulnerable road users, including equestrians, will be accommodated and their safety prioritised alongside wind farm traffic during both the construction and operational phases.

I trust that the above information is of assistance. If you have any questions or would like to discuss the needs of equestrians further, please do contact me.

Kind regards,

REDACT

Catriona Davies
Scotland Access Officer
The British Horse Society

Katie Butchart

From: radionetworkprotection@bt.com
Sent: 18 December 2024 16:27
To: Econsents Admin
Cc: radionetworkprotection@bt.com; Kevin Ainslie; Colin Abernethy
Subject: WID13666 - Scottish Government: Request for a Scoping Opinion for Watchman Energy Park, South Lanarks - ECU00006030

BT Group

OUR REF: WID13666T1-T16

Thank you for your email dated 04/12/24.

We have studied this proposed wind farm for Watchman Energy Park South Lanarks - **ECU00006030**, with respect to EMC and related problems to BT point-to-point microwave radio links.

Using the locations provided in Table A.C1 - Indicative Turbine Coordinates the conclusion is the proposed locations should not cause interference to BT's current and presently planned radio network.

BT requires 100m minimum clearance from any structure to the radio link path. If the proposed locations change, please let us know and we can reassess this for you.

Please note this refers to BT Radio Links only, you will need to contact other providers separately for information relating to other supplier links / equipment.

Please direct all queries to **radionetworkprotection@bt.com**

Kind regards

Debra Baldwin
National Radio Planner
Network Planning

From: Colin.Abernethy@gov.scot <Colin.Abernethy@gov.scot>
Sent: 04 December 2024 13:09
Cc: Kevin.Ainslie@gov.scot
Subject: WID13666 - Scottish Government: Request for a Scoping Opinion for Watchman Energy Park, South Lanarkshire

Dear Consultee,

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

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR WATCHMAN ENERGY PARK

In November 2024, Watchman Energy Park Limited (the Applicant) (a company wholly owned by Renewco Power Limited) submitted a request for a scoping opinion from the Scottish Ministers for the proposed section 36 application for Watchman Energy Park. The proposed development is anticipated to comprise up to 16 wind turbines with a maximum tip height of 240m, with a generating capacity greater than 50MW and a battery energy storage system (BESS) with a 50MW storage capacity. The site is situated entirely within the South Lanarkshire administrative

area, and is located approximately 10 km south of Crawford, 7 km south of Elvanfoot and 12 km west of Moffat.

This request is made in line with regulation 12 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Under regulation 12, Scottish Ministers are required to provide a scoping opinion outlining the information they consider should be included in the EIA report. Ministers are also required to consult the relevant consultation bodies and any other interested party which is likely to have an interest in the proposed development by reason of its specific environmental responsibilities or local and regional competencies.

The scoping report and associated documentation can be viewed online by:

- going to www.energyconsents.scot;
- clicking on the **Search** tab; then,
- clicking on **Simple Search** tab; then,
- typing Watchman Energy Park into **Search by Project Name** box and then clicking on **Go**; then,
- clicking on **ECU00006030** and then clicking on the **Documents** tab and then clicking on **Scoping Documents**.

For specific information relating to the proposed wind turbines coordinates, please see Appendix C of the Scoping report.
Indicative blade tip heights, hub heights and rotor diameters of the proposed turbines assume for a 155m hub height and 170m rotor diameter, with a total height to-tip of 240m.

To allow Scottish Ministers to provide a comprehensive scoping opinion, we ask that you review the scoping report and advise on the scope of the environmental impact assessment for this proposal. It would also be appreciated if consultees could answer the "Questions to Consultees" set out in the Scoping Report. Please advise if there are any further matters you would like Ministers to highlight for consideration and inclusion in the assessment, particularly site-specific information.

I would be grateful for your comments by **6th January 2025**. Please submit your response to Econsents_Admin@gov.scot (please note that there is an underscore _ between Econsents and Admin) (**please submit in PDF format if possible**).

Kind Regards,
Colin

Colin Abernethy | Case Manager | Energy Consents Unit
The Scottish Government | colin.abernethy@gov.scot
To view our current casework please visit www.energyconsents.scot

Defence Infrastructure Organisation

Teena Oulaghan
Safeguarding Manager
Ministry of Defence
Safeguarding Department
St George's House
DIO Headquarters
DMS Whittington
Lichfield
Staffordshire
WS14 9PY

Telephone [MOD]: 07970 170934

E-mail: teena.oulaghan100@mod.gov.uk

Your Reference: ECU00006030

Our Reference: DIO10065341

Colin Abernethy
Energy Consents Unit
Scottish Government
4th Floor
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

By email only

18 December 2024

Dear Colin,

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

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR WATCHMAN ENERGY PARK.

Thank you for consulting the Ministry of Defence (MOD) in relation to the scoping opinion request for Watchman Energy Park through your communication dated 4 December 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 16 turbines each with maximum blade tip heights of 240 metres above ground level and a battery energy storage system. The proposed development has been assessed using the location data (Grid References) below provided in “EIA Scoping Report” dated 11 September 2024.

Turbine no.	Easting	Northing
1	294884	605556
2	295257	605434
3	295501	606134
4	295016	606095

5	294582	605805
6	294029	608360
7	294219	608016
8	294427	607756
9	294806	607632
10	295240	607637
11	295208	608066
12	294416	607282
13	294004	606916
14	293847	606408
15	294078	605444
16	294775	605084

The principal safeguarding concerns of the MOD with respect to this development of wind turbines relates to the impact of the development on the Eskdalemuir Seismological Recording Station and the potential for the turbines to create a physical obstruction to air traffic movements.

Eskdalemuir Seismological Recording Station

The development site identified falls within the statutory consultation zone associated with the seismological recording station at Eskdalemuir (the array), an asset that forms part of the UK contribution to the Comprehensive Nuclear Test Ban Treaty.

Research has confirmed that wind turbines of current design generate seismic noise which can interfere with the operational functionality of the array. In order to ensure the United Kingdom can continue to implement its obligations in maintaining the Comprehensive Nuclear Test Ban Treaty a finite seismic noise capacity for the 50km radius surrounding the array, based on the findings of research, is managed by the MOD.

At this time, there is no seismic noise capacity available. The MOD must, therefore, make you aware that we will likely object to proposals for wind energy development in this location due to the unacceptable impact the proposed wind energy development would have on the operation and capability of the array.

Physical Obstruction

The application site falls within Tactical Training Area 20 (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.

There may be scope for the introduction of a physical obstruction to be addressed by planning conditions. If the developer is able to overcome other issues, , the MOD would require that conditions are added to any consent that might be issued requiring that the submission, approval, and implementation of an aviation lighting scheme and requiring the submission of sufficient data to ensure that structures can be accurately charted to allow deconfliction.

Summary

The MOD has concerns that this development is likely to have a detrimental impact on the operation and capability of the Eskdalemuir Seismological Recording Station and that it would introduce 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 "EIA Scoping Report" dated 11 September 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

REDACT

Teena Oulaghan
Safeguarding Manager

Katie Butchart

From: Safe Guarding <safeguarding@edinburghairport.com>
Sent: 19 December 2024 10:04
To: Econsents Admin
Cc: Safe Guarding
Subject: ECU00006030 - Watchman Energy Park

Good morning,

The proposed development has been fully examined from an aerodrome safeguarding perspective and does not conflict with safeguarding criteria.

We therefore have no objection to this proposal.

With best regards,
Claire

Claire Brown
Aerodrome Safeguarding & Compliance Officer

Edinburgh Airport
Where Scotland meets the world

Our values

t: +44 (0)131 344 3845 m: 07771 842927
My working hours are Monday-Friday
www.edinburghairport.com

Edinburgh Airport Limited
Room 3/54, 2nd Floor Terminal Building
EH12 9DN, Scotland

GLASGOW AIRPORT

FAO Colin Abernathy
Energy Consents Unit
By Email

19th December 2024

Dear Colin

Re: REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR WATCHMAN ENERGY PARK
Our reference: GLA4564

I refer to your request for scoping opinion received in this office on 4th December 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 and radar consultation area for Glasgow Airport;
- It is within instrument flight procedures safeguarding area and may impact. Detailed assessments will be required.

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
07808 115 881
Kirsteen.MacDonald@agsairports.co.uk

By email only

The Scottish Government
Energy Consents Unit
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU
FAO: Colin Abernethy

17 December 2024

Dear Colin

Glasgow Prestwick Airport

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

REQUEST FOR SCOPING OPINION – WATCHMAN ENERGY PARK.

Glasgow Prestwick Airport Ltd ("GPA", "the Airport") is supporting the Scottish and UK Governments' drive to release 20GW of renewable energy projects by 2030, working to facilitate over 4GW of potential wind power within a 45 nautical mile radius of the aerodrome. We continue to be actively engaged with numerous developers to address aviation safeguarding issues, including the resolution of infringements to published instrument flight procedures associated with The Airport.

We have reviewed the planning application documents available on the Energy Consents Unit (ECU) portal for the Watchman Energy Park (**ECU00006030**) and respond to the scoping consultation on aviation matters only.

Glasgow Prestwick Airport Ltd
Aviation House, Prestwick, Ayrshire, Scotland, KA9 2PL

T: +44 (0)1292 511038 **E:** ihutchinson@glasgowprestwick.com
www.glasgowprestwick.com safeguarding@glasgowprestwick.com

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 planning application in line with its Windfarm Safeguarding Assessment Process. The steps of that process are undertaken to ensure 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 Authority (CAA).

The Airport's Initial Safeguarding Assessment

2. The Initial Safeguarding Assessment confirms that the proposed development lies beyond the lateral limits of Glasgow Prestwick Airport's Controlled Airspace (CAS), it is in an area where the Airport's ATC regularly provide an air traffic control service.

3. Other issues identified in the assessment include:

   i. Direct radar line of sight between the Primary Surveillance Radar(s) at GPA and the turbines.

   ii. Potential disruption to multiple Instrument Flight Procedures and minimum safe altitudes due to the site's location on the approach to Runway 30.

   iii. Potential loss of VHF Ground to Air communications in the vicinity of the windfarm as a consequence of the large turbines and proximity to other developments in the area.

   iv. The need for aviation lighting for obstacles above 150m in height;

Primary Surveillance Radar (PSR)

Glasgow Prestwick Airport Ltd
Aviation House, Prestwick, Ayrshire, Scotland, KA9 2PL

T: +44 (0)1292 511038 **E:** ihutchinson@glasgowprestwick.com
www.glasgowprestwick.com safeguarding@glasgowprestwick.com

Our Values: **Passion Professionalism Integrity Responsibility**

Registered in Scotland 135362, VAT No. GB 617 1965 28
HR/Public/Form/087 Version 2

4. Preliminary Radar Line of Sight ("RLoS") analysis at the maximum proposed turbine tip heights of 240m for the development indicates that a number of the proposed turbines may be visible to the Airport's primary radar. Further assessments will be required to confirm this analysis. The degradative effect of wind turbines on PSR probability of detection of aircraft, and on air traffic controllers' displays, is now well documented.

   The Airport's Terma Scanter 4002 radar ("Terma") contains software which provides the potential for Terma to be optimised to mitigate the clutter. This is achieved through a process known as 'micro-blanking', where small 'holes' of surveillance coverage are removed during processing of the raw radar signal. The higher resolution of the Terma allows much smaller blanking areas to be implemented when compared with traditional S-Band radars. However, too many of these blanking areas in a geographical area regularly utilised by aircraft, for example where multiple windfarms are in close proximity to each other, will increase the probability of loss of radar detection of aircraft and therefore increase the risk of these degradative effects impacting on aviation safety. Furthermore, 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. While it is possible to estimate the PD following optimisation of Terma, the results are not guaranteed. The actual PD achieved after optimisation must 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 and an agreement between Airport and Developer will be required to cover those reasonable and demonstrable costs incurred by the Airport in discharging its regulatory responsibility to safeguard the airspace.

Glasgow Prestwick Airport Ltd
Aviation House, Prestwick, Ayrshire, Scotland, KA9 2PL

T: +44 (0)1292 511038 **E:** ihutchinson@glasgowprestwick.com
www.glasgowprestwick.com safeguarding@glasgowprestwick.com

Registered in Scotland 135362, VAT No. GB 617 1965 28
HR/Public/Form/087 Version 2

Instrument Flight Procedures (IFPs)

5. While this development is generally beyond the limit within which we would consider the need for an IFP Assessment necessary, Given the proposed maximum tip height (240m) of the turbines and an estimated height above sea level of 920m (3018ft) – which would make the development the tallest within the GPA Designated Operational Coverage and is itself above the height at which many of the Instrument Flight Procedures are based in terms of minimum safe levels - there is potential for infringement of safety buffers for multiple Airport departure and arrival procedures. If changes to climb or descent gradients were to be required to accommodate the wind farm, there would be a resulting reduction in operational safety margins to aircraft operating to and from the Airport, with the potential for certain types of aircraft that do not have the performance characteristics required ceasing their use of the Airport.

Technical Safeguarding – VHF Communication Equipment

6. Preliminary analysis indicates it may 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*.

   Any adverse effects identified as a result of an assessment will require to be mitigated for the lifetime of the windfarm.

Aviation Lighting

7. The Airport are keen to understand 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.

Glasgow Prestwick Airport Ltd
Aviation House, Prestwick, Ayrshire, Scotland, KA9 2PL

T: +44 (0)1292 511038 **E:** ihutchinson@glasgowprestwick.com
www.glasgowprestwick.com safeguarding@glasgowprestwick.com

Our Values: **Passion Professionalism Integrity Responsibility**

Registered in Scotland 135362, VAT No. GB 617 1965 28
HR/Public/Form/087 Version 2

8. GPA note that while solely a matter for the CAA to consider, should the aviation lighting scheme consider the use of Aircraft Detection Lighting System (ADLS) dependent upon Electronic Conspicuity (EC) Equipment, GPA respectfully request that they are consulted with further, should such an ADLS lighting scheme be incorporated into the finalised design.

Watchman Energy Park Scoping Report

9. In response to the aviation section commencing at Section 3.10 of the Watchman Energy Park Scoping Report, the Airport wishes to commence dialogue with the Developer to undertake the following aviation safeguarding assessments.

   i. A Radar Modelling Assessment (starting with a detailed Radar Line of Sight Analysis) against the Airport's PSR to establish if the Terma radar has the capability to mitigate the clutter from any visible turbines.

   ii. Should Radar Line of Sight visibility be confirmed and depending upon the number of visible turbines, A radar flight trial in the airspace above the proposed windfarm may be required to establish the Baseline Probability of Detection (PD) of the radar prior to the windfarm being constructed.

   iii. An IFP assessment against the Airport's published flight procedures (both RNAV/RNP and conventional); The findings of any Developer provided IFP reports would also need to be verified by our contracted IFP Safeguarding provider.

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

   v. Consultation on any changes to the proposed aviation lighting scheme.

Glasgow Prestwick Airport Ltd
Aviation House, Prestwick, Ayrshire, Scotland, KA9 2PL

T: +44 (0)1292 511038 **E:** ihutchinson@glasgowprestwick.com
www.glasgowprestwick.com safeguarding@glasgowprestwick.com

Conclusions

10. This development raises aviation safety concerns, and would have a potential operational impact on the Airport as an Air Navigation Services Provider (ANSP). The Airport will continue to develop its full ATC Operational Impact Assessment and the Technical Safeguarding Assessment(s) to consider the various impacts once the proposed development is at a developmental stage appropriate to the commission of those assessments and a credible result can be obtained. As part of those assessments, the Airport would wish to discuss with the Developer the terms of a suitable agreement to address the reasonable and demonstrable costs and risks which will be imposed upon it as a result of the proposed development.

11. Consequently, the Airport would lodge an initial **holding objection** to this development should the scoping proceed to a full Section 36 application.

Yours faithfully

REDACT

Ian Hutchinson
Aerodrome Safeguarding Manager
For and on behalf of Glasgow Prestwick Airport Limited

Glasgow Prestwick Airport Ltd
Aviation House, Prestwick, Ayrshire, Scotland, KA9 2PL

T: +44 (0)1292 511038 **E:** ihutchinson@glasgowprestwick.com
www.glasgowprestwick.com safeguarding@glasgowprestwick.com

Our Values: **Passion Professionalism Integrity Responsibility**

Registered in Scotland 135362, VAT No. GB 617 1965 28
HR/Public/Form/087 Version 2

Health and Safety Executive

Chemicals Explosives
Microbiological Hazards Division

Kathryn Deakin

Statutory and Commercial
Land Use Planning Advice
HSE, Harpur Hill,
Buxton, Derbyshire,
SK17 9JN

lupenquiries@hse.gov.uk

http://www.hse.gov.uk/

Head of Team
Stuart Reston

(by email only)
Energy Consents Unit,
The Scottish Government

Your Ref: ECU00006030
Our Ref: E2442

Date: 11 December 2024

For the attention of: Colin Abernethy

Dear Mr Abernethy,

Proposal: A wind farm and associated infrastructure including a Battery Energy Storage System (BESS) located on land approximately 10 km south of Crawford and 7 km south of Elvanfoot, South Lanarkshire, Scotland.

1. Thank you for your EIA scoping opinion request for any comments for reference ECU00006030 dated 04 December 2024 for the above proposed development at land approximately 10 km south of Crawford and 7 km south of Elvanfoot, South Lanarkshire, Scotland.

   Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 – regulation 12.
   - HSE's response is limited to our role in the land use planning system for the control of major industrial hazards involving hazardous substances.
   - HSE is not responding in our regulatory role in the health and safety system

2. The proposed development, being a wind farm and battery energy storage system, is not a type that would store or process hazardous substances in quantities relevant to the potential for industrial major accidents with respect to The Town and Country Planning (Hazardous Substances) (Scotland) Regulations 2015.

3. The development is not located within a safeguarding zone of an Explosives site licensed under the Explosives regulations 2014 or the Dangerous goods in harbour area regulations 2016.

4. The proposed development is located within HSE's land use planning consultation zones for a major accident hazard pipelines:
   - 7923_2180 – 11 Feeder Bathgate/Moffat operated by National Gas

   There is potential to initiate a major accident at the major accident hazard pipeline, for example, during the development construction phase and potentially the operational phase, because the development area intersects the route of the major accident hazard pipeline.

   HSE suggests that the EIA should show that the operator of the pipeline has been consulted regarding the following issues or that these issues have been considered in the assessment:
   - the development restricted area due to the pipeline
   - ensuring the integrity of the pipeline and protecting the pipeline from development and operational works.

5. HSE realises that Environmental Risk Assessments are not expected to include general health and safety at work however we take this opportunity to point out that it may be beneficial for employer(s) to undertake a risk assessment as early as possible to satisfy themselves that their design and operation will meet requirements of relevant health and safety legislation as the project progresses.

Yours sincerely,

Kathryn Deakin

Statutory and Commercial Land Use Planning Advice

Katie Butchart

From: JRC Windfarm Coordinations New <windfarms@jrc.co.uk>
Sent: 06 December 2024 11:19
To: Colin Abernethy
Cc: Malcolm Spaven; WindSPEN
Subject: Scottish Government: Request for a Scoping Opinion for Watchman Energy Park, South Lanarkshire [WF700675]

Follow Up Flag: Follow up
Flag Status: Completed

Dear Colin,

A Windfarms Team member has replied to your co-ordination request, reference **WF700675** 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 Sir/Madam,

***Planning Ref**:*

ECU00006030

***Name/Location**:*

Watchman Energy Park

***Site Centre/Turbine(s) at NGR**:*

T1 - 294884 605556

T2 - 295257 605434

T3 - 295501 606134

T4 - 295016 606095

T5 - 294582 605805

T6 - 294029 608360

T7 - 294219 608016

T8 - 294427 607756

T9 - 294806N607632

T10 - 295240 607637

T11 - 295208 608066

T12 - 294416 607282

T13 - 294004 606916

T14 - 293847 606408

T15 - 294078 605444

T16 - 294775 605084

***Development Radius**: 0.1km*

***Hub Height**: 122.5m **Rotor Radius**: 77.5m*

*This proposal is **cleared - subject to 50m Micrositing -** 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.

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, developers are advised to seek re-coordination prior to considering any design changes.

Regards

Wind Farm Team

Friars House
Manor House Drive
Coventry CV1 2TE
United Kingdom

Office: 02476 932 185

JRC Ltd. is a Joint Venture between the Energy Networks Association (on behalf of the UK Energy Industries) and National Grid.
Registered in England & Wales: 2990041
About The JRC | Joint Radio Company | JRC

We maintain your personal contact details and are compliant with the Data Protection Act 2018 (DPA 2018) for the purpose of 'Legitimate Interest' for communication with 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?id=34608

MOUNTAINEERING SCOTLAND WALKCLIMBSKI

The Granary | West Mill Street | Perth | PH1 5QP
T: 01738 493 942 E: info@mountaineering.scot
www.mountaineering.scot

By email to: Econsents_Admin@gov.scot

Energy Consents Unit
Directorate for Energy and Climate Change
5 Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

5 December 2024

Dear Sir/Madam

Watchman Wind Farm: Environmental Impact Assessment Scoping Report

ECU reference: ECU00006030

Background and Context

1. Renewco Power Ltd has submitted a Scoping Report for a wind farm of 16 turbines of 240m BTH on the Donalds west and southwest of the Daer Reservoir, in the gap between Clyde and Harestanes wind farms. There are two live applications to the east of the Daer Reservoir, Rivox and Daer, to which Mountaineering Scotland has objected on the basis of their closing the visual gap between the Clyde wind farm landscape and the Harestanes cluster. These applications sit adjacent to one another on the slopes of the watershed, immediately west of the Daer Reservoir.

2. Mountaineering Scotland is a membership organisation with 16,000 members and is the only recognised representative organisation for hill walkers, climbers, mountaineers and ski-tourers who live in Scotland or who enjoy Scotland's mountains. We represent, support and promote Scottish mountaineering, and provide training and information to mountain users for safety, self-reliance and the enjoyment of our mountain environment.

3. The turbines would be located on the upper slopes and ridgelines around Comb Law and Rodger Law, the latter turbines approaching within 1km of Ballencleuch Law. These three summits are 'Donalds', Scottish hills above 2000ft/610m that lie outwith the Highlands, and are often visited by hillwalkers. two further Donalds lie around 3km to the south (Scaw'd Law, Wedder Law) and the landmark Queensberry is within 7km southeast of the nearest turbine.

Assessment

Mountaineering Scotland endorses the hillwalking viewpoints listed in the Report: 1,3, 6-9, 11, 12 and 14. It is our opinion that Viewpoint 2, Pykestone Hill, selected to represent the view from the Tweeddale NSA, at a distance of 32km will have a negligible impact in the LVIA. We suggest a more

useful viewpoint from a hillwalking perspective would be Broad Law, in the same angle of view, significantly more popular and closer, and suggest this as a replacement for Pykestone Hill.

Yours sincerely

REDACT

Davie Black
Access & Conservation Officer
Mountaineering Scotland

T: 07555 769325

E: access@mountaineering.scot

Demi Gray

From: NATS Safeguarding <NATSSafeguarding@nats.co.uk>
Sent: 13 January 2025 15:28
To: Colin Abernethy
Cc: Kevin Ainslie; Econsents Admin
Subject: RE: Scottish Government: Request for a Scoping Opinion for Watchman Energy Park, South Lanarkshire [SG37731]
Attachments: SG37731 Watchman Energy Park Wind Farm - TOPA Issue 1.pdf

Our Ref: SG37731
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 SG37731.

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 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 Watchman Energy Park

Wind Farm Development

NATS ref: SG37731

LPA ref: if applicable

Issue 1

Contents

Publication History

Issue	Month/Year	Change Requests and summary
1	January 2025	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 Watchman Energy Park 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	Hub (m)	Tip (m)
1	55.3313	-3.6608	294740	605399	122.5	200
2	55.3343	-3.6545	295143	605720	122.5	200
3	55.3306	-3.6672	294333	605323	122.5	200
4	55.3376	-3.6567	295016	606095	122.5	200
5	55.3350	-3.6634	294582	605805	122.5	200
6	55.3578	-3.6731	294029	608360	122.5	200
7	55.3547	-3.6700	294219	608016	122.5	200
8	55.3524	-3.6666	294427	607756	122.5	200
9	55.3514	-3.6606	294806	607632	122.5	200
10	55.3515	-3.6537	295240	607637	122.5	200
11	55.3554	-3.6544	295208	608066	122.5	200
12	55.3482	-3.6666	294416	607282	122.5	200
13	55.3448	-3.6729	294004	606916	122.5	200
14	55.3387	-3.6757	293810	606240	122.5	200
15	55.3305	-3.6738	293909	605327	122.5	200
16	55.3267	-3.6622	294636	604884	122.5	200

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
Clee Hill Radar	52.3983	-2.5975	180.0	333.3	348.3	CMB
GDF Radar	54.6841	-2.4509	57.0	105.5	313.8	CMB
Lowther Hill Radar	55.3778	-3.7530	3.0	5.5	124.3	CMB
Perwinnes Radar	57.2123	-2.1309	122.7	227.3	205.2	CMB
Tiree Radar	56.4556	-6.9230	128.0	237.1	119.9	CMB
En-route Nav	**Lat**	**Long**	**nm**	**km**	**Az (deg)**	**Type**
None						
En-route AGA	**Lat**	**Long**	**nm**	**km**	**Az (deg)**	**Type**
Lowther Rx	55.3853	-3.7432	2.9	5.4	133.0	Rx
Lowther Tx	55.3902	-3.7355	2.9	5.4	139.0	Tx

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 (T1-T2, T4-T5, T7-T10, T12-T15)

Using the theory as described in Appendix A and turbine specific propagation profiles it has been determined that the terrain screening available will not adequately attenuate the signal for 12 of the turbines and therefore these are 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. 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

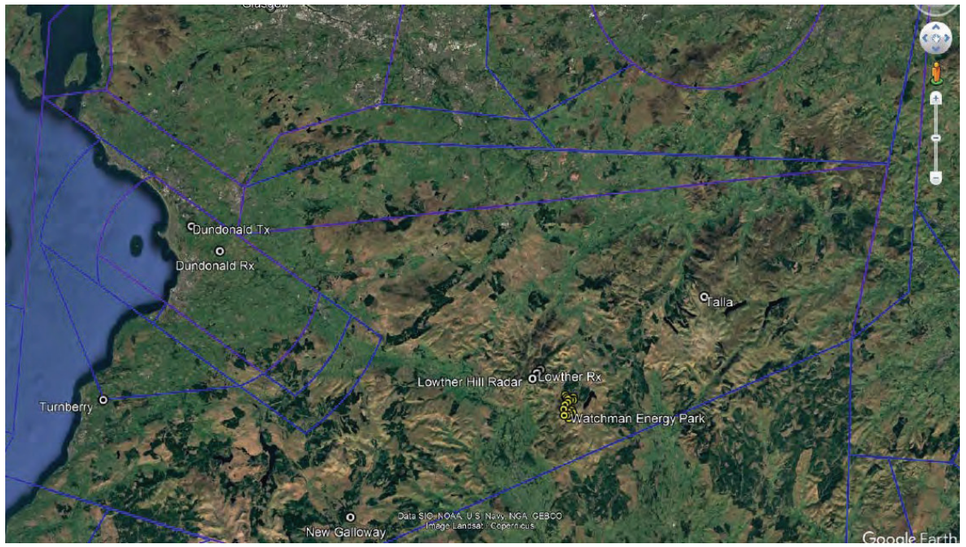


Figure 1: Proposed development location shown on an airways chart

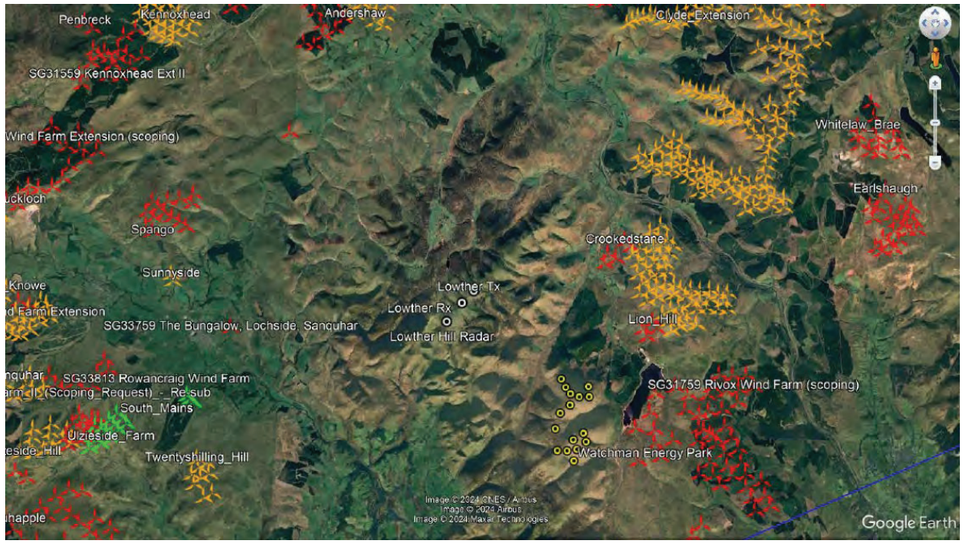


Figure 2: Proposed development shown alongside other recently assessed applications

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

Colin Abernethy
Energy Consents Unit
The Scottish Government
Sent by email to: Econsents_Admin@gov.scot

21 January 2025

Dear Colin,

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

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR WATCHMAN ENERGY PARK

Many thanks for consulting RSPB Scotland on the Request for Scoping Opinion for Watchman Energy Park (ECU00006030). We have made the following comments in response to the questions on ornithology set out in the Scoping Report.

Section 3.6 – Ornithology

ORN1 - Do consultees agree that the range of ornithology surveys carried out are sufficient and appropriate?

Whilst we agree that the range of survey work is appropriate, we do not consider that the scope of this work is sufficient to assess the ornithological status at this site due to limitations in survey coverage as we summarise below in ORN2.

ORN2 - Do consultees agree that the survey areas and buffers adopted for each ornithology survey are appropriate?

Vantage Point Survey (VP)
Section 3.6.17 of the Scoping Report states that proposed turbines 6, 7, 8, 11 and 13 were not visible during VP surveys in the 2022/23 non-breeding season or the 2023 breeding season (Figure 3.6.1). NatureScot guidance[1] states that VP surveys should encompass "the proposed turbine envelope if known, or the maximum extent of potential turbine layouts". We therefore disagree with the statement in section 3.6.18 of the Scoping Report that "this is not considered a limitation to subsequent assessment" and

[1] SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms

RSPB South Scotland
Dumfries & Galloway Office
The Old School, Crossmichael
Castle Douglas, Kirkcudbrightshire
DG7 3AP

Tel: 01556 670 464
@RSPBDumfriesandGalloway
@RSPBDandG
rspb.org.uk/Scotland

consider that the exclusion of approximately one third of the turbine envelope from VP assessment for one year of survey effort is likely to have a direct effect on the robustness of the EIA assessment.

Black Grouse
It is not clear from the Scoping Report whether two years of Black Grouse lek surveys were carried out, as Section 3.6.28 only discusses surveys carried out in 2023. Although no Black Grouse were recorded during these surveys, the Scoping Report states that "possible lekking calls" were heard during VP surveys (3.6.29). We are aware of recent records of lekking Black Grouse from within the boundary of the proposed development, as confirmed through survey work for Daer wind farm. Survey work for other wind farms in the area also recorded lekking Black Grouse within or just beyond the 1.5km buffer: Clyde (operational), Daer (in planning ECU00000740), and Rivox (in planning ECU00003293). We therefore consider that the status of Black Grouse at this site has been under-recorded.

NatureScot guidance[1] states that the survey area must cover the entire development footprint plus a 500m buffer for breeding and wintering bird surveys, increasing to 1.5km for Black Grouse and 2km for raptors. Whilst we agree that the recommended buffer distances given above have been used, Figure 3.6.1 shows that the 2022/23 non-breeding and 2023 breeding bird surveys and Black Grouse surveys did not include the northern part of the development area. Therefore, these surveys did not encompass the entire development plus the appropriate buffer zones. Walkover surveys undertaken in 2023/24 appear to have covered the whole of the turbine envelope, but not the southern part of the site (Figure 3.6.2).

Based on the above issues, we recommend that an additional year of survey work (VP, breeding and wintering birds, Black Grouse) encompassing the whole of the development boundary plus appropriate buffers is undertaken, to ensure two full years of baseline survey to inform the assessment of ornithological status at this site.

ORN3 - Are there any other relevant consultees who should be consulted, or other sources of available information that should be considered?

We strongly recommend that a data search is made with the South of Scotland Golden Eagle Project (SSGEP) to obtain data on Golden Eagle tracking data for the development footprint and appropriate buffer area to inform the EIA assessment.

Due to the presence of recently active Black Grouse leks within the site boundary and nearby as identified through survey work for other wind farms, we **recommend that additional Black Grouse lek records are sought from neighbouring wind farms to inform the status of Black Grouse at this site and to assist survey effort**.

ORN4 - Do consultees agree with the features/ impacts proposed to be scoped out from further assessment?

As Golden Eagle were recorded on site through survey work, and as consultation with the SSGEP does not appear to have taken place, we do not agree with the decision to scope out Golden Eagle from the EIA. **We recommend that Golden Eagle is scoped in for further assessment at EIA.**

Black Grouse is a BoCC red-listed, UK BAP species which is undergoing severe declines in southern Scotland, with fewer than 200 lekking males recorded across the region in recent years. As such, it is a high priority for conservation action, and full consideration needs to be given to the impacts of this development on Black Grouse, both lekking and nesting. Therefore, due to the likely presence of Black Grouse on site and within 1.5km of the site, and due to the lack of coverage of survey effort to date, **we recommend that Black Grouse is scoped into the EIA.**

This development falls within a key area for breeding waders, as identified through RSPB's work with the Clyde Valley Wader Initiative (CVWI); a project working closely with farmers and landowners in South Lanarkshire to increase breeding wader productivity through habitat enhancement and innovative management. Many breeding wader species are declining across the UK, and it is important that the impacts of development on these key species are fully considered. Therefore, **we recommend that breeding waders are scoped into the EIA, with particular regard to cumulative impacts on Curlew and Lapwing.**

We note that in Section 3.6.63 no mention is made of the potential impact of disturbance to birds, however, disturbance can have a large impact on breeding birds in particular, especially during the construction period, and it is important that this impact is fully considered in the EIA.

We hope that our comments are useful. If you have any questions or would like to discuss our comments further, please don't hesitate to get in touch.

REDACT

REDACT

West
Conservation Officer
sarah.west@rspb.org.uk

ScotWays
Upholding public access

Econsents_Admin@gov.scot

Colin Abernethy
Case Manager
Energy Consents Unit
The Scottish Government

Our Ref: 11323
18/12/2024

Dear Mr Abernethy,

ECU ref: ECU00006030
ELECTRICITY ACT 1989

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

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR WATCHMAN ENERGY PARK

Thank you for your email of 4 December 2024 seeking comments on the scoping report for the above proposal.

ScotWays records

The enclosed map shows that rights of way SL170 and SL171 as recorded in the National Catalogue of Rights of Way (CROW) cross or are close to the application site as shown on Figure 1.1 *Site Location.*

The enclosed map shows other path SL180 as recorded in the National Catalogue of Rights of Way (CROW) crosses or is close to the application site as shown on Figure 1.1 *Site Location.*

The enclosed map shows the Heritage Paths project promotes routes, *Daer Water to Thornhill* and *Daer Water to Kirkpatrick* for their historic interest. These old routes cross or are close to the application site as shown on Figure 1.1 *Site Location.*

The enclosed map shows that our book *Scottish Hill Tracks* describes routes SHT(6)063 and SHT(6)064 which cross or are close to the application site as shown on Figure 1.1 *Site Location*.

In searching our records at this scoping stage, we have focussed solely on the **immediate** area of the proposed application. If required by the applicant to inform their Environmental Impact

Assessment (EIA), maps of a wider search area are available from the Society, alongside a more detailed response.

Other Access to Land

You should be aware that other forms of public access to land may affect the proposed application site. More detail about these other types of access is set out in the enclosed Catalogue of Rights of Way Guidance Notes. The applicant may already be aware that SL180 forms part of the Southern Upland Way, a long distance route which is used by walkers, runners and cyclists. This route is promoted by NatureScot (formerly Scottish Natural Heritage) as one of Scotland's Great Trails.

Wind Farms and public access

It is our understanding that there is very little guidance regarding the siting of turbines in relation to established paths and rights of way, so we use the following starting principle in considering what could be reasonable:
"a minimum distance, equivalent to the height of the blade tip, from the edge of any public highway (road or other public right of way) or railway line."

ScotWays considers the above sets out a reasonable principle for a recommended minimum separation distance. There could also be site specific factors which would lead us to prefer a larger minimum separation distance; these could include the affected route being one of Scotland's Great Trails or it being known for equestrian use, for example. Whilst it appears that turbines are not proposed in close proximity to the Southern Upland Way (where we would prefer a larger separation distance) we request that the applicant provides information with regard to turbine distances in relation to the rights of way noted above as it appears some may be proposed closer than the principle noted above. ScotWays is likely to object to any proposal where the above principle is not followed, including where a micro-siting allowance could lead to turbine encroachment upon a route because it has been insufficiently buffered.

Recreational amenity

As well as direct impacts of development upon public access, ScotWays has an interest in impacts on recreational amenity, so this includes the impact of wind farm development on the wider landscape. We anticipate that the applicant will take into account both recreational amenity and landscape impacts in developing their proposals for this site. We will consider these issues further should this scoping stage lead to a planning application.

Cumulative Impact

As ScotWays is aware of a number of wind turbine proposed in this general area, we are particularly concerned that the cumulative impact of these proposed developments is taken into account. We are concerned about the impact the wind farm development will have on the views from the *Southern Upland Way (*SUW*).* As we are aware of a large number of wind farm applications along this nationally important route the Society anticipates that the cumulative impact on the length of the SUW, as well as this individual section, will be taken into account.

Comment

Under section 3 of the Land Reform (Scotland) Act 2003, there is a duty upon landowners to use and manage land responsibly in a way which respects public access rights. Under section 14 of the same Act, access authorities have a duty to uphold access rights. Accordingly, we suggest that the applicant may wish to approach the relevant authority's access team for their input when drawing up their Access Management Plan for their proposed development.

I hope the information provided is useful to you. Please do not hesitate to contact us if you have any further queries.

Yours sincerely,

REDACTED

Lynda Grant
Access Officer

CROW Guidance Notes - Windfarm Developments

These notes explain what is shown on the map(s) provided with our comments and provide information about the public right of access to land in Scotland. All maps are provided on a 1:50,000 scale base.

What is the Catalogue of Rights of Way (CROW)?

CROW was created by ScotWays in the early 1990s with the help of Scottish Natural Heritage (now NatureScot) and local authorities and is an amalgamation of rights of way information from a number of different sources. Mapped at 1:50,000 scale, the catalogue does not include all rights of way – many of these are known only to local people and come to ScotWays' notice only when a problem arises.

CROW is continually updated to take account of new information as it comes to ScotWays' attention.

What is a Recorded Right of Way?

Any right of way that we record in the Catalogue of Rights of Way.

Where any Recorded Rights of Way pass through or close to the wind farm application site a map will be provided showing them.

What is an Other Route?

Any path that we record in the Catalogue of Rights of Way that does not appear to meet the criteria to be a right of way.

Where any Other Routes pass through or close to the wind farm application site a map will be provided showing them.

What is a Heritage Path?

A historic route that forms part of the transport heritage of Scotland. Such routes reflect our cultural and social development and include drove roads, military roads, Roman roads, pilgrim routes and trade routes.

These routes may or may not be rights of way, core paths or carry some other type of designation.

Find out more about the Heritage Paths project at http://www.heritagepaths.co.uk

Where any Heritage Paths pass through or close to the wind farm application site a map will be provided showing them.

What is a Scottish Hill Track?

First published in 1924, our book *Scottish Hill Tracks* is a record of the network of paths, old roads and rights of way which criss-cross Scotland's hill country, from the Borders to Caithness.

The Scottish Rights of Way and Access Society, 24 Annandale Street, Edinburgh EH7 4AN (Registered Office)
0131 558 1222 info@scotways.com www.scotways.com

These publicised routes may or may not be rights of way, core paths or carry some other type of designation.

Copies of our book *Scottish Hill Tracks* can be purchased from the ScotWays webshop: https://www.scotways.com/shop

Where any *Scottish Hill Tracks* routes pass through or close to the wind farm application site a map will be provided showing them.

Disclaimer

The routes shown on the CROW maps provided have been prepared from information contained in the records of ScotWays, local authorities, judicial and other records. The inclusion of a route in CROW is not in itself definitive of its legal status.

Other Public Access Information

You should be aware that other forms of public access to land may affect the wind farm application site.

Unrecorded Rights of Way

Our records only show the rights of way that we are aware of. Scots law does not require a right of way to be recorded in a specific document or register. Any route that meets the following criteria will be a right of way. This could include any paths, tracks or desire lines within your area of interest. A right of way:

1. Connects public places.
2. Has been used for at least 20 years.
3. Follows a more or less defined route.
4. Has been used by the public without judicial interruption or the landowner's permission.

Core Paths

The Land Reform (Scotland) Act 2003 requires all access authorities to create a system of routes within their area. These are known as core paths and are recorded in the authority's core paths plan. It is anticipated that applicants will have consulted the relevant access authority's core paths plan to check whether any core paths cross or are close to the wind farm application site, and will also have consulted the authority's access team.

The General Right of Access

Irrespective of the presence or absence of rights of way and core paths, the land in question may be subject to the access rights created by Section 1 of the Land Reform (Scotland) Act 2003. Unless the land falls into one of the excluded categories in Section 6 of this Act, the public has a right of access to the land, and land owners/managers have a duty under the Act's Section 3 to consider this in any decisions made about the use/management of the land.

Other Promoted Routes

There may be a promoted route running through or close to any wind farm application site. Such routes will usually be clearly marked with signposts or waymarking and may feature in guidebooks, leaflets, on local information boards and on websites. The two main types of nationally promoted routes are:

Scotland's Great Trails: https://www.scotlandsgreattrails.com
National Cycle Network: https://www.sustrans.org.uk/map-ncn

Public and Private Roads

The Roads (Scotland) Act 1984 created the terms ‘public road’ and ‘private road’. Public roads are those roads which are on the List of Public Roads and which, importantly, the roads authority is required to manage and maintain. Private roads are those roads which are not on the List of Public Roads and thus there is no duty on the roads authority to manage or maintain them. There is a public right of passage over these roads and the owner(s) of a private road may not restrict or prevent the public’s right of passage over the road.

If required, the local roads authority should be contacted by the applicant for more information on public and private roads that may cross or pass close to the application site.

More Information on Outdoor Access Law

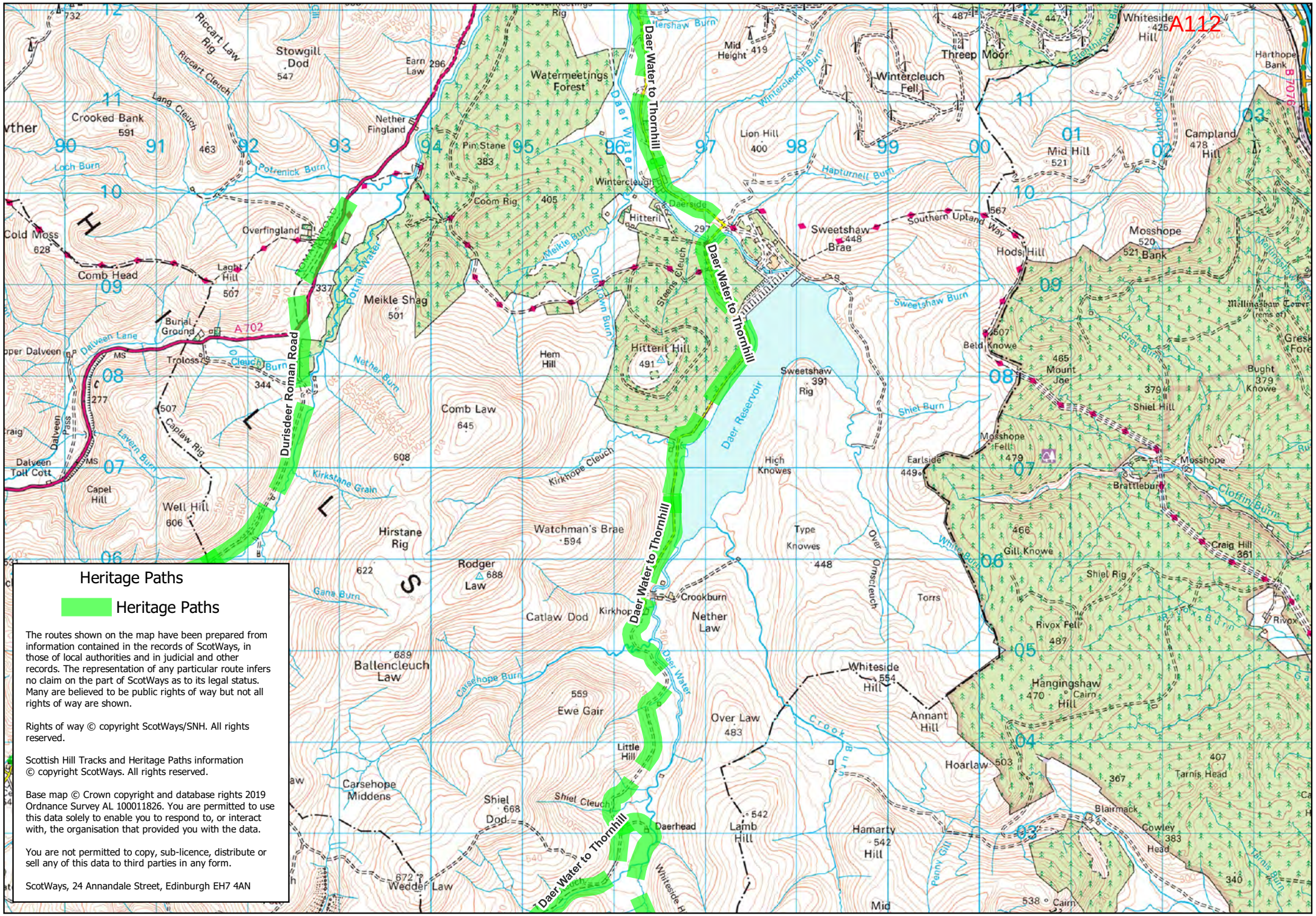
If you would like to know more about outdoor access law, visit our website (https://scotways.com/outdoor-access/) or get a copy of our book “*The ScotWays Guide to the Law of Access to Land in Scotland”* by Malcolm M Combe (https://www.scotways.com/shop).

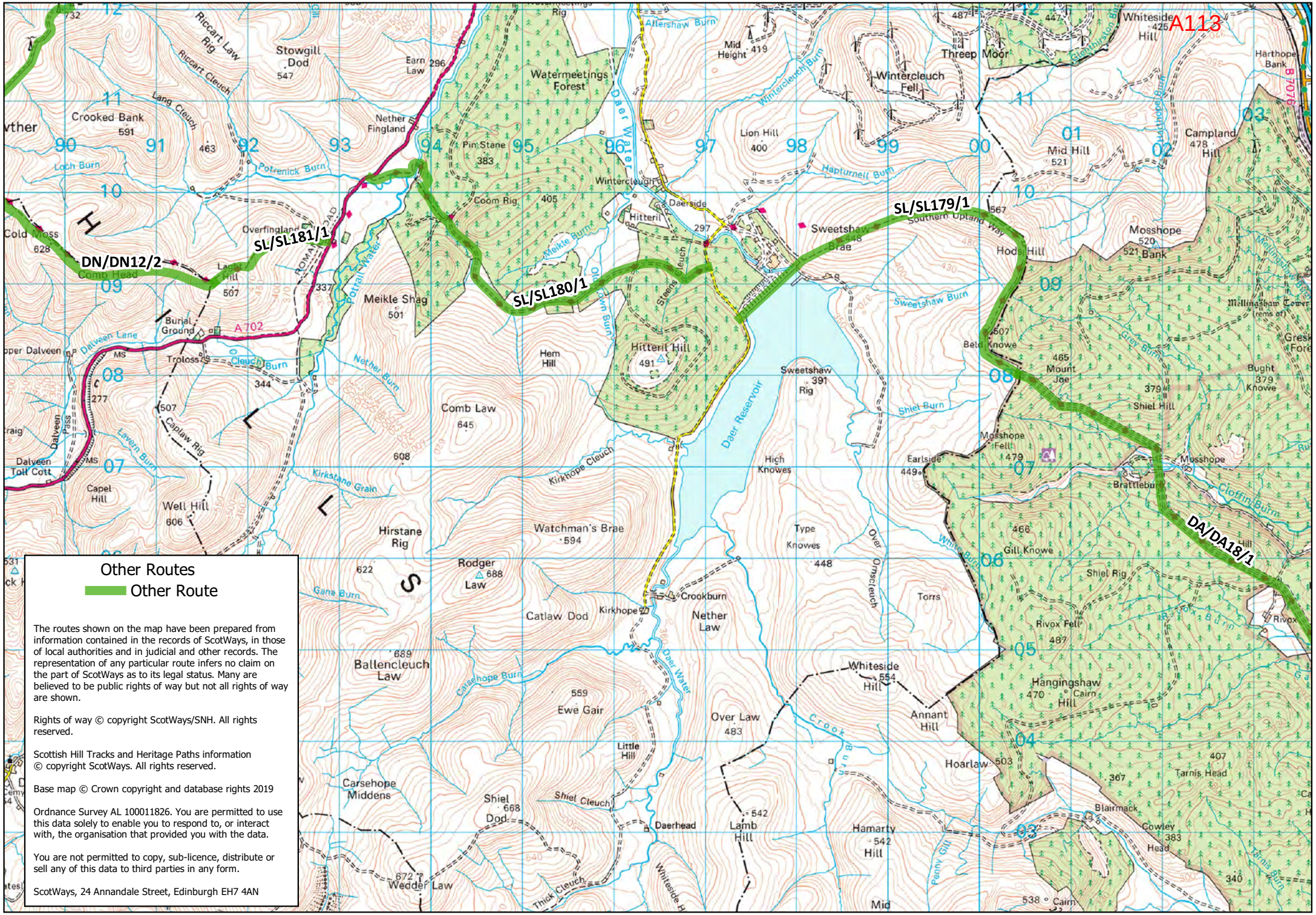
Development and Planning Applications

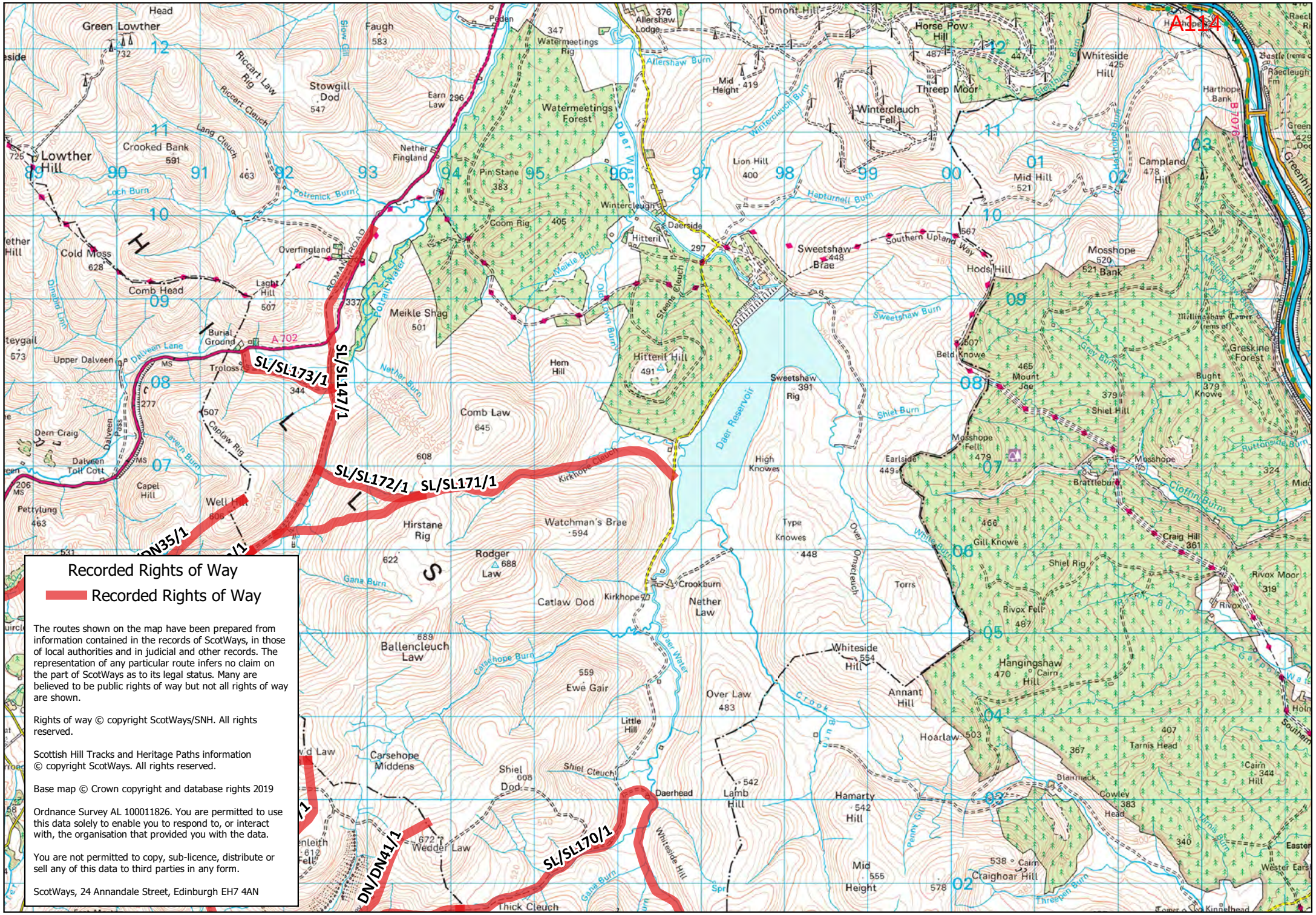
When proposing to develop a site, it is advisable that the applicant reviews the current amount and type of public access across it and presents this as an access management plan as part of their application. This should include rights of way, core paths, other paths and tracks, and take account of how the statutory right of access currently affects the site.

The plan should then set out the effect that the proposed works, both during construction and upon completion, would have on the patterns of public access identified. Any good practice guidance associated with the proposed type of development should be considered, e.g. for windfarms the NatureScot “*Good Practice during Wind Farm Construction, Part 8 Recreation and Access”* and *“Siting and Designing Wind Farms in the Landscape”*, and the policies contained within any local statutory plans.

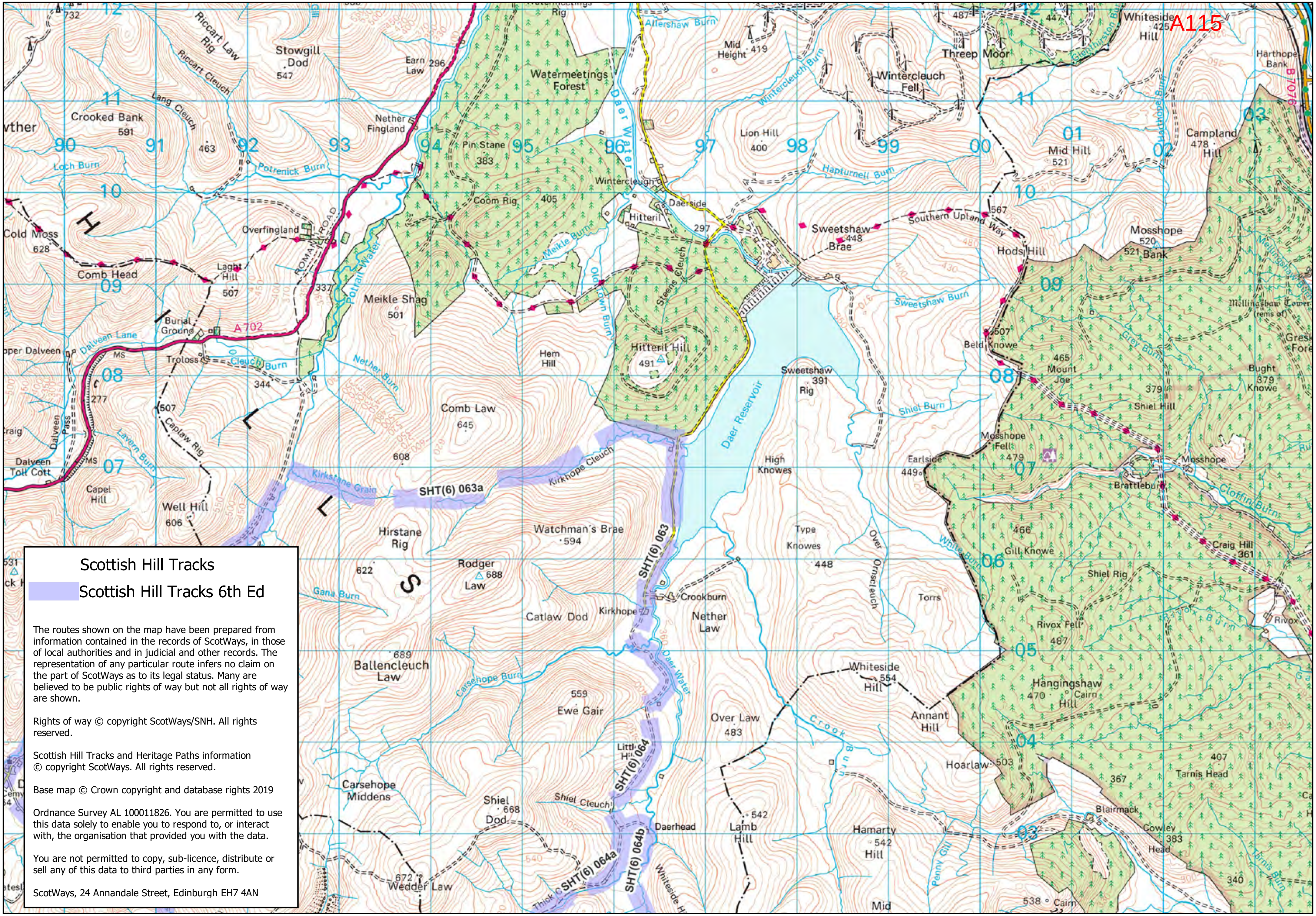
Depending upon the proposals, there may be specific legal processes that must be followed to divert any paths or tracks whether temporarily or permanently. These will be in addition to getting planning consent for the proposal. We recommend that applicants contact the access team at the relevant access authority for advice in this regard.


A112
Daer Water to Thornhill
Durisdeer Roman Road
A702
Heritage Paths
Heritage Paths
The routes shown on the map have been prepared from information contained in the records of ScotWays, in those of local authorities and in judicial and other records. The representation of any particular route infers no claim on the part of ScotWays as to its legal status. Many are believed to be public rights of way but not all rights of way are shown.
Rights of way © copyright ScotWays/SNH. All rights reserved.
Scottish Hill Tracks and Heritage Paths information © copyright ScotWays. All rights reserved.
Base map © Crown copyright and database rights 2019 Ordnance Survey AL 100011826. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data.
You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
ScotWays, 24 Annandale Street, Edinburgh EH7 4AN


SL/SL181/1
DN/DN12/2
SL/SL180/1
SL/SL179/1
DA/DA18/1
A113
A702
Other Routes
Other Route
The routes shown on the map have been prepared from information contained in the records of ScotWays, in those of local authorities and in judicial and other records. The representation of any particular route infers no claim on the part of ScotWays as to its legal status. Many are believed to be public rights of way but not all rights of way are shown.
Rights of way © copyright ScotWays/SNH. All rights reserved.
Scottish Hill Tracks and Heritage Paths information © copyright ScotWays. All rights reserved.
Base map © Crown copyright and database rights 2019
Ordnance Survey AL 100011826. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data.
You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
ScotWays, 24 Annandale Street, Edinburgh EH7 4AN


A114
SL/SL173/1
SL/SL147/1
SL/SL172/1
SL/SL171/1
DN/DN41/1
SL/SL170/1
Recorded Rights of Way
Recorded Rights of Way
The routes shown on the map have been prepared from information contained in the records of ScotWays, in those of local authorities and in judicial and other records. The representation of any particular route infers no claim on the part of ScotWays as to its legal status. Many are believed to be public rights of way but not all rights of way are shown.
Rights of way © copyright ScotWays/SNH. All rights reserved.
Scottish Hill Tracks and Heritage Paths information © copyright ScotWays. All rights reserved.
Base map © Crown copyright and database rights 2019
Ordnance Survey AL 100011826. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data.
You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.
ScotWays, 24 Annandale Street, Edinburgh EH7 4AN

A115



Scottish Hill Tracks

Scottish Hill Tracks 6th Ed

The routes shown on the map have been prepared from information contained in the records of ScotWays, in those of local authorities and in judicial and other records. The representation of any particular route infers no claim on the part of ScotWays as to its legal status. Many are believed to be public rights of way but not all rights of way are shown.

ScotWays, 24 Annandale Street, Edinburgh EH7 4AN

Friday, 17 January 2025

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
Follow Us

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

Dear Customer,

Watchman Energy Park, South Lanarkshire
Planning Ref: ECU00006030
Our Ref: DSCAS-0123027-MLL
Proposal: A wind farm and associated infrastructure including a Battery Energy Storage System (BESS) located on land approximately 10 km south of Crawford and 7 km south of Elvanfoot, South Lanarkshire, Scotland.

Please quote our reference in all future correspondence

Scottish Water has no objection to this proposal. 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 the proposed activity falls within drinking water catchments where Scottish Water abstractions are located. Scottish Water abstractions are designated as Drinking Water Protected Areas (DWPA) under Article 7 of the Water Framework Directive. Daer Reservoir supplies Daer Water Treatment Works (WTW) and it is essential that water quality and water quantity in the area are protected. In the event of an incident occurring that could affect Scottish Water we should be notified immediately using the Customer Helpline number **0800 0778 778**.

I can confirm that some infrastructure from Watchman Energy Park lies within the Daer Reservoir catchment, which supplies the Daer & Camps WRZ. The proposed development is for 16 turbines and associated infrastructure.
The proposed plan for turbines includes:

- 11 turbines within the catchment (#1, 2, 3, 4, 5, 10, 12, 13, 14, 15, 16)
- 5 turbines outside the catchment (#6, 7, 8, 9, 11)

The closest turbine (#3) is located just over 1km from the reservoir edge. Of the 11 turbines that are within the catchment, 5 of these are on the catchment border (#10, 12, 13, 14 and 15).

This development is classed as a Medium risk with regard to water resource (quantity) and water quality impact.

The Daer & Camps WRZ is currently in yield deficit and the reservoir is a crucial resource for this zone. As such, the Water Resources Team preference would be for borderline turbines to be moved outside of the catchment.

For turbines remaining in the Daer catchment it is important that during construction drainage is not directed out of the catchment and it may be worth considering if turbine 3 should be removed all together or the turbine layout at least considered.

We also require confirmation if the turbines and associated infrastructure will be PFAS free. Scottish Water now sample for PFAS and detections are acted upon with the DWQR.

We should be notified of any pollution incidents impacting the water course as a result of the works. Catchment boundaries derived at this map scale can be subject to uncertainty and ground-truthing may be required to confirm whether borderline infrastructure is within or outside the catchment.

Scottish Water have produced a list of precautions for a range of activities. This details protection measures to be taken within a DWPA, the wider drinking water catchment and if there are assets in the area. Please note that site specific risks and mitigation measures will require to be assessed and implemented. These documents and other supporting information can be found on the activities within our catchments page of our website at www.scottishwater.co.uk/slm

We welcome receipt of this notification about the proposed activity within drinking water catchments where Scottish Water abstractions are located.

The fact that this area is located within a drinking water catchment should be noted in future documentation. Also, anyone working on site should be made aware of this during site inductions.

Further communication about this development and commencement of operations should be notified to us at protectdwsources@scottishwater.co.uk 3 months in advance of the start date on site if at all possible.

Asset Impact Assessment

Scottish Water records indicate that there is live infrastructure in the proximity of your development area that may impact on existing Scottish Water assets.

The applicant must identify any potential conflicts with Scottish Water assets and contact our Asset Impact Team via our Customer Portal for an appraisal of the proposals.

The applicant should be aware that any conflict with assets identified will be subject to restrictions on proximity of construction. Please note the disclaimer at the end of this response.

Written permission must be obtained before any works are started within the area of our apparatus.

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 refer to our guides which can be found at https://www.scottishwater.co.uk/Help-and-Resources/Document-Hub/Business-and-Developers/Connecting-to-Our-Network which detail our policy and processes to support the application process, evidence to support the intended drainage plan should be submitted at the technical application stage where we will assess this evidence in a robust manner and provide a decision that reflects the best option from environmental and customer perspectives.

Next Steps:

All developments that propose a connection to the public water or waste water infrastructure are required to submit a Pre-Development Enquiry (PDE) Form via our Customer Portal prior to any formal technical application being submitted, allowing us to fully appraise the proposals

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,

Angela Allison
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."

Supplementary Guidance

- 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
- Scottish Water's current minimum level of service for water pressure is 1.0 bar or 10m head at the customer's boundary internal outlet. Any property which cannot be adequately serviced from the available pressure may require private pumping arrangements to be installed, subject to compliance with Water Byelaws. If the developer wishes to enquire about Scottish Water's procedure for checking the water pressure in the area, then they should write to the Development Operations department at the above address.
- If a connection to the public sewer and/or water main requires to be laid through land out-with public ownership, the developer must provide evidence of formal approval from the affected landowner(s) by way of a deed of servitude.
- Scottish Water may only vest new water or waste water infrastructure which is to be laid through land out with public ownership where a Deed of Servitude has been obtained in our favour by the developer.
- The developer should also be aware that Scottish Water requires land title to the area of land where a pumping station and/or a Sustainable Drainage System (SUDS) proposed to vest in Scottish Water is constructed.
- Please find information on how to submit application to Scottish Water at our Customer Portal.

A120

Development Management and Strategic Road Safety
Roads Directorate

George House 36 North Hanover St Glasgow G1 2AD
Direct Line: 0141 272 7593
lain.clement@transport.gov.scot

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

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

econsents_admin@gov.scot

Your ref:
ECU00006030

Our ref:
GB01T19K05

Date:
19/12/2024

Dear Sirs,

ELECTRICITY ACT 1989

THE ELECTRICITY (APPLICATIONS FOR CONSENT) REGULATIONS 2017

REQUEST FOR SCOPING OPINION FOR PROPOSED SECTION 36 APPLICATION FOR WATCHMAN ENERGY PARK

With reference to your recent correspondence on the above development, we acknowledge receipt of the Scoping Report (SR) prepared by Ramboll in support of the above development.

This information has been passed to SYSTRA Limited for review in their capacity as Term Consultants to Transport Scotland – Roads Directorate. Based on the review undertaken, Transport Scotland would provide the following comments.

Proposed Development

The proposed Watchman Energy Park comprises a wind farm of approximately 16 turbines with a maximum tip height of 240m and associated infrastructure including a BESS with approximately 50MW capacity, located approximately 9km west of the M74 and 10km south of Crawford in South Lanarkshire. The SR states that the final choice of access route to site has yet to be finalised but will either be from the A702 or B7076.

Assessment of Environmental Impacts

Section 3.8 of the SR presents the proposed methodology for the assessment of Traffic and Transport. This states that the assessment will be carried out in accordance with the Institute of Environmental Management and Assessment (IEMA) Guidelines, entitled Environmental Assessment of Traffic and Movement (July 2023). These specify that road links should be taken forward for further assessment where the following two rules are breached:

Rule 1: Include road links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)

A121

Rule 2: Include road links of high sensitivity where traffic flows have increased by 10% or more.

We note that the proposed study area encompasses both access options, and includes the M74 between Junctions 13 and 15, the A702 between Junction 13 of the M74 through to Carronbridge, the B7076 from Junction 12 of the M74 through to Junction 15 and the Daer Water Road. We also note that base traffic data will be obtained from the Department of Transport (DfT) traffic survey database, Traffic Scotland database and other public datasets that are available for the M74. In addition, future traffic flows will be factored using Low Growth factors estimated from National Road Traffic Forecasts (NRTF).

Transport Scotland is satisfied with this approach.

It is noted that any impacts associated with the operational and decommissioning phases of the development are to be scoped out of the EIA. We would consider this to be acceptable in this instance.

Abnormal Loads Assessment

The SR states that detailed swept path analysis will be undertaken for the main constraint points on the route from the port of entry (likely to be KGV Docks in Glasgow) through to the site access junction to demonstrate that the turbine components can be delivered to site and to identify any temporary road works which may be necessary. We would add that Transport Scotland will require to be satisfied that the size of turbines proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path.

For your awareness, Transport Scotland is currently undertaking essential works on the Woodside Viaduct on the M8 northern flank. Temporary traffic management measures and weight restrictions are in force. The route is therefore not appropriate for abnormal loads, with all HGV traffic encouraged to use the M74 and M73 as an alternative. At this time, there is no timeframe for completion of the works.

I trust that the above is satisfactory but should you wish to discuss any issues raised in greater detail, please do not hesitate to contact me or alternatively, Alan DeVenny at SYSTRA's Glasgow Office on 0141 343 9636.

Yours faithfully,

REDACT

Iain Clement

Transport Scotland
Roads Directorate

cc Alan DeVenny – SYSTRA Ltd.

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.			

Technical Appendix 1.6: Telecommunications Report

WATCHMAN ENERGY PARK, SOUTH LANARKSHIRE: TELECOMMUNICATIONS REPORT

September 2025

Report No.23/1174/RAM/2

Reservoir House, Gladhouse, Midlothian EH23 4TA
Tel: 01875 830750
E-mail: malcolm@aviatica.co.uk

1. Introduction

1.1 Aviatica has been commissioned to investigate the potential impact of a proposed wind energy development at Watchman Energy Park, South Lanarkshire, on fixed telecommunications links in the surrounding area.

1.2 The proposed development comprises thirteen wind turbines with a maximum tip height of 240 metres above ground level (AGL) and rotor diameter of 170 m.

2. Telecommunications baseline

2.1 Interrogation of the Ofcom Spectrum Information Portal and Wireless Telegraphy Register[1] has found one fixed microwave link crossing or within 1 km of the boundary of the Proposed Development. This is a link operated by Mobile Broadband Network Ltd (MBNL) between Shiel Dod and Green Lowther. MBNL is a joint venture between EE and 3UK.

2.2 Wind turbines can also have adverse effects on fixed telecommunications links in the Ultra High Frequency (UHF) band. These include scanning telemetry links operated by the energy and water industries and terrestrial television re-broadcast links operated by Arqiva.

2.3 The Joint Radio Company (JRC) was consulted on 4 September 2025 to determine if it operates any scanning telemetry links in the vicinity of the Site. JRC confirmed on 16 September 2025 that "*this proposal is cleared - subject to 50 m micrositing - with respect to radio link infrastructure operated by the local energy networks.*"

2.4 AtkinsRéalis UK Limited was consulted on 4 September 2025 to determine if it operates any scanning telemetry links in the vicinity of the Site. It responded on 4 September 2025 stating: "*The above application has now been examined in relation to UHF Radio Scanning Telemetry communications used by our Client in that region and we are happy to inform you that we have NO OBJECTION to your proposal*."

2.5 Arqiva was consulted on 4 September 2025 to determine if it operates any television re-broadcast links in the vicinity of the Site. It responded on 4 September 2025 stating: "*We have considered whether this development will have any adverse effect on our operations and have concluded that we have no objection. T2 is closest at approx. 7.8 km SE of nearest Arqiva RBL*."

3. Assessment of MBNL link

3.1 The layout design of the Proposed Development has taken into account the location of the MBNL link with the design objective of maintaining a horizontal clearance of at least 100 m between the maximum extent of the blade tips of all turbines and the boresight of the MBNL link.

3.2 The closest turbine in the proposed layout to the MBNL link is T8. The minimum clearance between the blade tips of T8 and the MBNL link will be 147.7 m.

3.3 MBNL was consulted on the Proposed Development on 4 and 18 September 2025. It responded on 25 September stating: "*I can confirm that there are no infringement issues with the EE/3UK mobile microwave network from the proposed turbine cluster at the coordinates you have supplied*."

3. Summary and Conclusions

3.1 There is one fixed microwave telecommunications link within 1 km of any of the proposed Watchman Energy Park turbine positions. The operator of that link has advised that the Proposed Development will have no effects on their link.

3.2 There are no other fixed telecommunications links, such as scanning telemetry and TV re-broadcast links, in the vicinity that may be affected by the Proposed Development. It is concluded that the Proposed Development will have no effects on scanning telemetry or TV re-broadcast links.

3.3 It is concluded that the Proposed Development will have no effects on fixed telecommunications links and that these can be scoped out of EIA assessment.

[1] https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information-portal

Technical Appendix 1.7: Eskdalemuir Seismic Impact Study

Document Summary

To support the development of the Watchman Wind Farm, Xi Engineering Consultants provides this report to Watchman Energy Park Limited with insight into the feasibility of the site with regards to constraints imposed by being within the Eskdalemuir Consultation Zone (ECZ). The contained planning considerations and calculations also demonstrate to planning authorities and the MoD Renewco's consideration and compliance in development of the site from the start.

This report assesses the seismic impact of the proposed 13-turbine Watchman Wind Farm on the Ministry of Defence's (MoD) Eskdalemuir Seismic Array (EKA), which is used to detect global nuclear testing. The site lies within the 50 km Eskdalemuir Consultation Zone and must comply with strict vibration limits to protect the array's functionality.

The expected ground vibration ('seismic budget') was analysed and compared against both current MoD thresholds and the proposed Seismic Impact Limit (SIL) policy being developed by the Scottish Government and MoD. Development within the Eskdalemuir Consultation Zone is only possible with revised policy including regulation around the SIL limit.

18 computer models were used to predict the seismic noise produced by each of the proposed turbines at Watchman Wind Farm.

Purpose – Summary of Key Points Examined:

1. What is the predicted seismic budget that will be consumed by Watchman?
2. Do the turbines meet the Seismic Impact Limit (for deployments of 1.0, 2.0 or 2.5 GW*)?

Seismic Budget Findings

The estimated seismic budget required for Watchman Wind Farm was calculated in line with the latest approach under consideration by the Eskdalemuir Working Group (EWG). A seismic budget requirement between 0.011178 nm and 0.039832 nm was predicted. If the most up-to-date proposed Industry Tool prediction method is employed, the estimated seismic budget is 0.027222 nm.

Seismic Impact Limit Analysis Findings

SILs for potential deployments of 1.0 GW, 2.0 GW and 2.5 GW were analysed.

The industry recommended SIL is for a 2.0 GW deployment.

All models analysed predicted that all 13 turbines at Watchman Wind Farm could be built without any mitigation while meeting SILs for deployments between 1.0 to 2.5 GW.

*Seismic Impact Limit (SIL) deployments under consideration for policy are 1.0, 2.0, and 2.5GW. The industry recommendation, and deployment highlighted as preferred in policy negotiations, is a 2.0 GW deployment.

Contents

1. Introduction

This Report is prepared by Xi Engineering Consultants on behalf of Watchman Energy Park Limited, to assess the potential vibration impact of the Watchman Wind Farm on the MoD's Eskdalemuir Seismic Array using quantified operational turbine data.

The Watchman Wind Farm site lies within the Eskdalemuir Consultation Zone (for further background please see Appendices 6.1 - 6.3) and is yet to be allocated a seismic budget.

The following key points are examined in this report:

1. What is the predicted seismic budget that will be consumed by Watchman?
2. Do the turbines meet the Seismic Impact Limit (for deployments of 1.0, 2.0 or 2.5 GW)?

1.1. Methodology Summary

An analysis was carried out of the 13 turbines in the proposed Watchman Wind Farm (see Appendix 6.4 for full wind farm specifications) to determine the seismic budget requirement as well as the seismic impact based on three potential Seismic Impact Limit (SIL) deployments (1.0, 2.0 and 2.5 GW). The industry recommendation is a 2.0 GW deployment.

18 models were run based on Refined Phase 4 'AIFCL-101-Phase4-Rev-v13' including the current MoD algorithm, Phase 4 synthetic models and directly measured data (SG 6.6-155). These models were used to predict the seismic amplitude contributed by each turbine at Watchman Wind Farm.

The models are scalable and can be used to predict seismic amplitudes for turbines with different dimensions and rated powers. For example, the SG 6.6-155 model may be used to predict the seismic amplitude of a SG 7.0-170 turbine by scaling the data based on the increased turbine dimensions.

Four queue scenarios were also investigated to determine the impact of Watchman Wind Farm on the overall EKA seismic budget of 0.336 nm with respect to the farms place in the queue.

For the detailed Methodology please see Appendix 6.6.

1.2. Definitions

In this report, the following nomenclature in Table 1 is employed for clarity:

Acronym	Definition	Notes
SIL	Seismic Impact Limit	Constant limit on seismic impact at EKA per wind turbine, relative to generation capacity. Ranges from 0.00836 nm.MW$^{-0.5}$ for 1.0 GW total deployed capacity in the ECZ to 0.00528 nm·MW$^{-0.5}$ for a 2.5 GW capacity. The level of the SIL is still a point of debate.
PSV	Power Seismic Value	The permitted seismic impact of a turbine based on its power output. (Phase 5 - Equation 1)
TMR	Turbine Mitigation Ratio	Ratio defining if mitigation is required for a turbine. TMR < 1 requires mitigation. (Phase 5 - Equation 2). Turbine with TMR ≥1 require no mitigation and have TMR listed as "not applicable" (N/A).
MoD	Ministry of Defence	UK central government department responsible for the UK's security and interests, with jurisdiction over the protection and management of the EKA.
EKA	Eskdalemuir Seismic Array	Seismological monitoring station in the Scottish Borders which forms part of the UK's obligations under the Comprehensive Test Ban Treaty (CTBT).
ECZ	Eskdalemuir Consultation Zone	The 50 km radius protected area around the EKA, within which construction of wind farms must follow formal approval procedures with the MoD and the Scottish Government.

Table 1 – Summary of acronyms used in this report relating to Seismic Impact Limit.

1.3. Summary of Seismic Budget and SIL Process

The following should be considered when reading this report:

- The **seismic budget requirement** is the seismic noise (a vertical displacement amplitude given in nanometres) generated by a wind farm, corrected for the propagation of the seismic waves to the EKA.
- The **overall seismic budget** is the cumulative seismic noise that all wind farms in the ECZ cannot exceed. This is set as **0.336 nm**.
- The **budget allocation** is the maximum permitted level of seismic noise a wind farm can generate. Currently, Watchman Wind Farm does not have a budget allocation.

- The **Seismic Impact Limit (SIL)** is an upper limit to seismic impact on the EKA that any one turbine is responsible for relative to its electrical generation capacity. Likely to be within the range of 0.00836 nm.MW$^{-0.5}$ for 1.0 GW total capacity deployed in the ECZ down to 0.00528 nm·MW$^{-0.5}$ for 2.5 GW total capacity.
- The **Power Seismic Value (PSV)** is the maximum permitted seismic amplitude that an individual turbine can generate. The PSV can be calculated by **multiplying the SIL by the square root of the rated power** (in MW) of the turbine.
- The **Turbine Mitigation Ratio (TMR)** is the ratio of the PSV divided by the seismic amplitude of an individual turbine. If the **TMR is greater than or equal to 1**, this indicates that the SIL is met and no mitigation is required. If the **TMR is less than 1**, this indicates that the SIL is **not** met and mitigation and/or curtailment may be necessary to reduce seismic vibration of that turbine.

A flowchart summarising the Seismic Budget and SIL process is shown below in Figure 1:

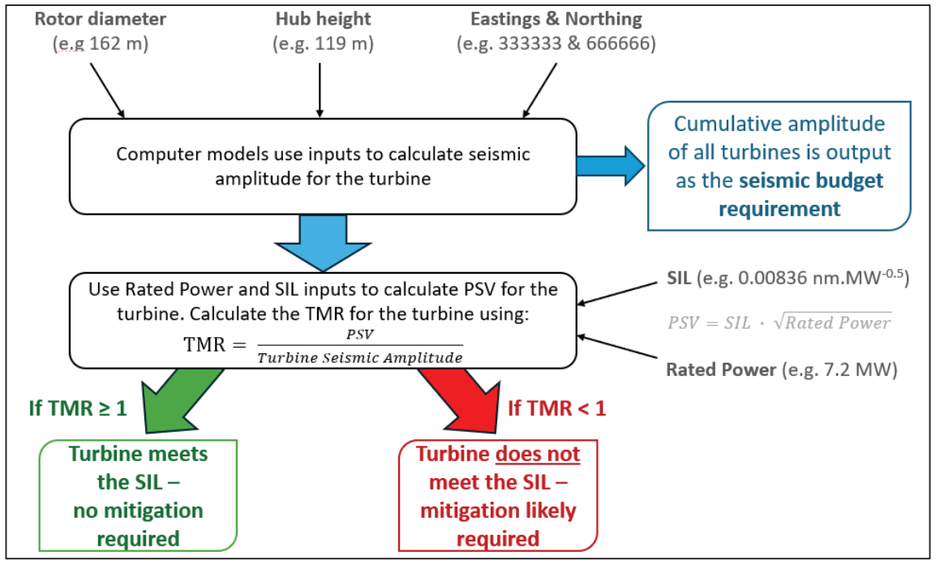


Figure 1 – Flowchart summarising the process for Seismic Budget and SIL calculations

2. Results

This section summarises results based on assumed 170 m rotor diameter, 155 m hub height and 240 m tip height. Seismic budget calculations show the overall seismic noise contributions of turbines installed at Watchman Wind Farm as well as the individual turbine contributions. The SIL calculations show if all turbines could be built at Watchman Wind Farm while meeting the SIL for different deployments (1.0, 2.0 and 2.5 GW) and, if not, how many turbines would require mitigation to meet the SIL.

2.1. The seismic budget requirements for Watchman Wind Farm

The estimated seismic budget required for Watchman Wind Farm was found to range between 0.039832 nm using the current MoD algorithm down to 0.011178 nm for the SG 6.6-155 directly measured model with background noise included.

Currently, the industry's Eskdalemuir Seismic Budget Calculation Tool uses the worst-case Phase 4 model of turbines still available on the market to predict the seismic budget of a wind farm. **In this case, it is the GE model that applies, estimating a required seismic budget of 0.027222 nm for Watchman Wind Farm.**

Budget requirements are further reduced if background noise is removed.

The following table (Table 2) shows the seismic budget levels of the Wind Farm as a whole site using the various potential turbine options, with and without background noise, respectively. Highest seismic results are indicated in red while the lowest are indicated in green.

The seismic budget levels for individual turbines are listed in the Appendix (Section 6.7) using the various modelled turbine options, with and without background noise, respectively.

Watchman Wind Farm budget allocation:		**TBC**	
Model		**With background noise**	**Without background noise**
		Seismic level (nm)	**Seismic level (nm)**
Standard EKA Algorithm		0.039832	0.031866
Phase 4 Synthetic models	Siemens	0.024787	0.019829
	Senvion	0.017402	0.013921
	Vestas	0.027030	0.021624
	GE	0.027222	0.021778
	Nordex	0.019780	0.015824
	Enercon	0.018689	0.014952
	Gamesa	0.036193	0.028954
Scaled direct measurements	SG 6.6-155	0.011178	0.008942

Table 2 – Seismic results of scenarios modelled using Phase 4 data plus SG 6.6-155 (all results are in nm).

2.2. Seismic Impact Limit and Turbine Mitigation Ratio Results

To prevent sites close to the array from disproportionately using available Seismic Vibration Budget, the Scottish Government intends to implement a Seismic Impact Limit (SIL). The level of the SIL is still a point of debate but will be between 0.00836 nm·MW$^{-0.5}$ (for a 1.0 GW deployment) and 0.00528 nm·MW$^{-0.5}$ (for a 2.5 GW deployment), and will likely be set for all new wind turbines installed in the Eskdalemuir Consultation Zone.

Turbines at Watchman Wind Farm were analysed using all Phase 4 and directly-measured models where it was found that, **for any considered deployment between 1.0 GW and 2.5 GW, all turbines meet the SIL and it is predicted that no mitigation would be necessary**.

The tables below show the SIL analysis results for deployments of 1.0, 2.0 and 2.5 GW using Phase 4 synthetic models as well as scaled measured data (Siemens SG 6.6-155). Table 3 shows results from models including background whilst Table 4 shows results with background noise removed.

The Power Seismic Value (PSV) is the permitted seismic impact of an individual turbine based on its power output. The Turbine Mitigation Ratio (TMR) is the seismic output of each individual turbine divided by the PSV. Indicatively, **a TMR greater than 1 signifies that the turbine will not require mitigation for the given SIL while a TMR less than 1 signifies that the turbine will likely require mitigation to meet the given SIL**. For a full list of definitions please see Sections 1.2 and 1.3.

In the tables below, results coloured green indicate no mitigation is required for the installation of all turbines at Watchman Wind Farm according to the model and given SIL. Results coloured red indicate some mitigation is required to meet the given SIL.

Full TMR results for each individual turbine and model can be seen in Appendix 6.8.

With background noise	Deployment (*Power Seismic Value*)								
	1.0 GW (*0.022107 nm*)			2.0 GW (*0.015632 nm*)			2.5 GW (*0.013981 nm*)		
Model	*No. of turbines requiring mitigation*	*Highest TMR*	*Lowest TMR*	*No. of turbines requiring mitigation*	*Highest TMR*	*Lowest TMR*	*No. of turbines requiring mitigation*	*Highest TMR*	*Lowest TMR*
Standard EKA	0	2.178	1.765	0	1.540	1.248	0	1.378	1.116
Siemens	0	3.487	2.851	0	2.465	2.016	0	2.205	1.803
Senvion	0	4.976	4.050	0	3.518	2.864	0	3.147	2.561
Vestas	0	3.198	2.613	0	2.261	1.848	0	2.023	1.653
GE	0	3.179	2.592	0	2.248	1.833	0	2.011	1.639
Nordex	0	4.370	3.572	0	3.090	2.526	0	2.764	2.259
Enercon	0	4.647	3.756	0	3.286	2.656	0	2.939	2.375
Gamesa	0	2.384	1.956	0	1.686	1.383	0	1.508	1.237
SG 6.6-155	0	7.834	6.207	0	5.540	4.389	0	4.955	3.926

Table 3 – Summary of SIL analysis for models with background noise included – Note red denotes the SIL is NOT met.

Without background noise	Deployment (*Power Seismic Value*)								
	1.0 GW (*0.022107 nm*)			2.0 GW (*0.015632 nm*)			2.5 GW (*0.013981 nm*)		
Model	*No. of turbines requiring mitigation*	*Highest TMR*	*Lowest TMR*	*No. of turbines requiring mitigation*	*Highest TMR*	*Lowest TMR*	*No. of turbines requiring mitigation*	*Highest TMR*	*Lowest TMR*
Standard EKA	0	2.723	2.206	0	1.925	1.560	0	1.722	1.395
Siemens	0	4.358	3.564	0	3.082	2.520	0	2.756	2.254
Senvion	0	6.220	5.063	0	4.398	3.580	0	3.934	3.202
Vestas	0	3.997	3.267	0	2.827	2.310	0	2.528	2.066
GE	0	3.974	3.240	0	2.810	2.291	0	2.513	2.049
Nordex	0	5.462	4.465	0	3.862	3.157	0	3.455	2.824
Enercon	0	5.808	4.694	0	4.107	3.319	0	3.674	2.969
Gamesa	0	2.981	2.445	0	2.108	1.729	0	1.885	1.547
SG 6.6-155	0	9.793	7.759	0	6.924	5.486	0	6.193	4.907

Table 4 – Summary of SIL analysis for models with background noise removed – Note red denotes the SIL is NOT met.

As can be seen in Table 3 and Table 4, all TMRs are greater than 1 for all turbines indicating that **all 18 computer models predict that no mitigation would be required at Watchman Wind Farm to meet any potential SIL** (for deployments between 1.0 to 2.5 GW).

3. Discussion

This report asks two key questions for Watchman Wind Farm:

1. What is the predicted seismic budget that will be consumed by Watchman?
2. Do the turbines meet the Seismic Impact Limit (for deployments of 1.0, 2.0 or 2.5 GW*)?

The following subsections summarise the analysis conducted in this report that provide predictive answers to these questions.

*Seismic Impact Limit (SIL) deployments under consideration for policy are 1.0, 2.0, and 2.5GW. The industry recommendation, and deployment highlighted as preferred in policy negotiations, is a 2.0 GW deployment.

3.1. Predicted Budget Requirements

The mathematical approach used in this document assesses the level of seismic budget required to build Watchman Wind Farm dependant on specific computer models and inclusion or removal of background noise.

The predicted required seismic budget ranges from 0.039832 nm using the current MoD algorithm down to 0.011178 nm for the SG 6.6-155 directly measured model with background noise included. The budget range based on Phase 4 measurements including background is between 0.036193 nm for the no longer available Gamesa Machine and 0.017402 nm for the Senvion Machine. **If the 'worst case' of the Phase 4 measured turbines that are currently available on the market were to be allocated, the GE turbine with a budget requirement of 0.027222 nm would be used. This is in-line with the current method used for seismic budget prediction from the Industry Tool.**

3.2. Predicted SIL Requirements

The Seismic Impact Levels for the Watchman Wind Farm have been assessed for a range of 1.0 GW to 2.5 GW deployment within the Eskdalemuir region. The 1.0 GW and 2.5 GW SIL limits represent a turbine SIL of 0.00836 nm.$MW^{-0.5}$ and 0.00528 nm·$MW^{-0.5}$ respectively. It should be noted that these figures might change during the SG and MoD signoff process. For the proposed 7.0 MW turbines at Watchman Wind Farm the permitted PSVs are between 0.022107 nm and 0.013981 nm (again for 1.0 GW and 2.5 GW respectively).

Assessment against all data including the current MoD algorithm shows that the turbines at Watchman Wind Farm are predicted to meet the SIL without mitigation for any potential deployment between 1.0 GW and 2.5 GW.

4. Conclusion

The Watchman Wind Farm proposal includes 13 turbines (expected rated power of 7.0 MW each), positioned 30.6 – 32.7 km from the Eskdalemuir seismic array. This location places the site under scrutiny for its potential impact on seismic monitoring.

- Seismic Budget Requirements:
  - The models predicted that the seismic budget requirement of Watchman Wind Farm will be between 0.011178 nm (Best Case: SG 6.6-155 model) and 0.039832 nm (Worst Case: current MoD algorithm).
  - If the worst-case Phase 4 model of a turbine still available on the market is used (which is in-line with current Industry Tool calculation methods) then the predicted seismic budget is 0.027222 nm.
  - If background noise is removed, it is predicted that seismic amplitudes could be further decreased (~20% reduction).

- Seismic Impact Limit Analysis:
  - All 13 turbines at Watchman Wind Farm are predicted to meet the SIL and will not require any mitigation according to all 18 computer models and all three potential deployments (1.0, 2.0 and 2.5 GW) analysed in this report.

- Future Steps:
  - Watchman Energy Park Limited would need to demonstrate the minimisation of the seismic levels through performing candidate turbine, background and post-construction (operational) measurements, to be in line with proposed Government Policy.

5. Reference Documents

Phase 1: 'Seismic Vibration produced by wind turbines in the Eskdalemuir region Release 2.0 of Substantial Research Project'
Phase 2: 'SGV_202_Tech_Report_v07'
Phase 3: 'SGV 203 Technical report v12.pdf'
Phase4 (Refinement): 'AIFCL-101-Phase4-Rev-v1:- Field audit of Selected sites within the EKA Consultation Zone to support Government Policy Decisions'
Phase 5 (Revision): 'AIFCL-101-Phase5-Rev-v11'
Onshore wind - policy statement refresh 2021

All publicly available documents can be downloaded
https://www.scottishrenewables.com/membership/policyupdates/policy-making-process/onshore-wind/eskdalemuir-working-group

6. Appendix

6.1. Eskdalemuir Summary

The Eskdalemuir Seismic Array (EKA) is operated and safeguarded by the Ministry of Defence (MoD) and is used to detect ground vibration (seismic waves) caused by nuclear weapons tests. Wind turbines in the Eskdalemuir region also create seismic waves which reduce EKA's detection capabilities. To protect the detection capabilities of EKA, a 50 km consultation zone (Eskdalemuir Consultation Zone, ECZ) has been placed around the array and the cumulative impact of all wind turbines built within the zone must not exceed a seismic vibration budget of 0.336 nm. For full history of the EKA and policy updates, see appendix 6.2.

Xi Engineering Consultants (Xi), as technical experts in vibration, noise, and engineering for renewables, have provided guidance to policy stakeholders in the development of new policy, as well as the supporting infrastructure and procedures for industry. This includes development of the technical algorithms utilised by the MoD, the software tool the MOD currently use for management of the ECZ, and official policy documentation for public release.

To ensure that the 0.336 nm budget is not exceeded the MoD maintained a list of operational and planned wind farms and used an algorithm based the hub height and rotor diameter of wind turbines to estimate the impact of newly proposed wind farms as they entered the planning system. The Watchman Wind Farm site lies within the Eskdalemuir Consultation Zone and has yet to be allocated a seismic budget.

Work conducted by the Scottish Government have shown there is substantial additional budget based on moving from the 'worst case' algorithm approach to a turbine specific prediction model. The Scottish Government's draft Onshore Wind Policy Statement consultation is intended to open up additional budget and optimise the deployment within the ECZ and, to achieve this, a Seismic Impact Limit (SIL) has been proposed. The SIL is an upper limit to seismic impact on EKA that any one turbine is responsible for relative to its electrical generation capacity. Based on The Scottish Government's analysis provided by Xi, the SIL will likely be set between $0.00836\ nm \cdot MW^{-0.5}$ and $0.00528\ nm \cdot MW^{-0.5}$.

The calculation of the SIL is based on the headroom remaining were all sites in the MoD queue prior to Fawside windfarm built out in full within their budget allocation irrespective of any SIL implications. As such, Watchman Wind Farm has been treated in the same manner as the Scottish Government reports Phase 4 and 5, where no SIL was specified on sites prior to Fawside.

This report assumes a working understanding of considerations within the EKA. For further details, please see Appendix 6.2 as well as publicly available documents listed in reference section 5.

In line with the resulting policy and reporting procedures, Watchman Energy Park Limited need to demonstrate understanding of the absolute level of seismic budget required by the site - taking these figures into consideration in ongoing planning of the site and modifying where necessary in order to remain within budget.

With this considered, this report examines:

1. The seismic budget requirements for Watchman Wind Farm
2. Which turbines will meet potential Seismic Impact Limits for deployments of 1.0, 2.0 and 2.5 GW.

6.2. Background to Eskdalemuir

The Eskdalemuir Seismic Array is a seismological monitoring station in Dumfries and Galloway which forms part of the UK's obligations under the Comprehensive Test Ban Treaty. The array's operation can be compromised by excessive seismic noise in the vicinity, which can be produced by wind turbines operating around the array. A brief explanatory video about the global network of seismic sensors operated by the Comprehensive Test Ban Treaty Organisation (CTBTO) can be found at;

Video on Seismic Measurement by CTBTO: https://www.youtube.com/watch?v=daZ7IQFqPyA

In May 2005, Scottish Ministers and the Ministry of Defence (MoD) issued a technical site direction with a safeguarding map to relevant planning authorities in England and Scotland as well as Scottish Ministers. This direction advised that any sites within 50 km of the array would require consultation with MoD before determination. This 50 km radius is often referred to as the 'consultation zone'. Within the consultation zone there is an existing hard no-build area at a radius of 10 km from the array – any applications for windfarms within 10 km will be objected to by MoD due to the unacceptable impact they would have on the array.

In 2005, a report by Styles recommended a threshold (commonly referred to as the "noise budget") of 0.336 nm of seismic noise disturbance would prevent the array's operation being comprised. Exceeding the 0.336 nm threshold would compromise the array's detection capabilities.

This was followed by the 2014 work undertaken by Xi Engineering Consultants on behalf of the Eskdalemuir Working Group, which developed a purposefully conservative algorithm and associated spreadsheet tool enabling the MoD to manage this seismic ground vibration threshold and thereby safeguard the detection capabilities of the array. The adoption of this 2014 Xi Algorithm allowed in excess of 1.1 GW onshore wind development to proceed.

The 0.336 nm budget was issued on a first come, first served basis and no project has been allocated budget since January 2018. The MoD's position is that, at present, the threshold of

0.336 nm has been reached when using the 2014 Xi Engineering Consultants conservative spreadsheet to calculate the cumulative impact of Wind Turbines on the Eskdalemuir seismic array. As this is the only tool the MoD has available it is objecting to all applications to preserve the array's detection capabilities. Any additional applications received subsequent to January 2018 were added to a 'waiting list' for future MoD approval. The current waiting list based on publicly available data corresponds to approximately 2.5 GW of potential onshore wind turbine development. These potential developments would have a significant impact on the 12 GW targeted by The Scottish Government by 2030.

6.2.1. 2019-2022 Scottish Government Commissioned Xi Engineering Studies

Between 2019 and 2022 the Scottish Government commissioned Xi Engineering Consultants to deliver a series of technical evaluations and studies. These studies followed a phased approach (Phase 1 through Phase 5) to investigate the potential additional capacity that may be made available were the 2014 algorithm to be revised. These studies confirmed that the algorithm currently used by the MoD to calculate the budget takes a conservative approach and, by design, over-estimates the seismic contribution of each wind turbine.

The Scottish Government has engaged with MoD to seek the MoD's approval of data collected and are seeking agreement that the MoD will adopt this evidence-based approach and adjust the calculation for budget utilisation.

Unlocking potential capacity whilst safeguarding the array has become the task of the reformed Eskdalemuir Working Group (EWG) with the Scottish Government taking role of secretariat and recognises that:

- Safeguarding of the array lies within the MoD policy remit.
- Maximisation of renewable energy deployment lies within the Scottish Government policy remit.

6.2.2. Eskdalemuir Working Group (EWG) scope of works for 2023 to deliver additional capacity for the region.

A draft scope of works has been issued for the Eskdalemuir Working Group (EWG) to produce guidance and is targeting 2023 for delivery. *

The following is a direct excerpt from the Draft Scope of works.

Given current demands on resource for Scottish Government and Ministry of Defence, we suggest a preliminary timeframe of Q4 2023 for finalisation of this guidance.

The document reiterates the MoD refenced section from the ONWPS (2.51.2)

Unlocking potential capacity whilst safeguarding the array will require decisive and meaningful action from the Scottish Government and UK Government. To do so, we must recognise:

- *Safeguarding of the array lies within the MoD policy remit.*
- *Maximisation of renewable energy deployment lies within the Scottish Government policy remit.*

The Draft scope of works for the Eskdalemuir working Group puts forward Proposed Approach(es) specifically.

Following these conversations and reflecting on the results of the recent draft Onshore Wind Policy Statement consultation, as well as the multi-phased technical work, the Scottish Government are minded pursuing the following approaches:

1. *Establishing a Seismic Impact Limit for Eskdalemuir Seismic Array and the consultation zone*

In order to secure a minimum additional capacity of 1 GW within this zone and encourage the use of turbines with the lowest seismic impact, the Scottish Government would require that any proposal yet to be determined must limit the seismic impact of each individual turbine within the consultation zone to 0.00836 nm.MW$^{-0.5}$ and ensuring the 0.336 nm threshold is not exceeded.*

**This limit is based on calculations undertaken by Xi Engineering on behalf of the Scottish Government and may be subject to slight variation during formal signoff process by MoD.*

2. Deployment Maximisation Zone at the Eskdalemuir Seismic Array

To aid in protection of the array, in addition to maximising potential for onshore wind deployment in areas with lesser impact on the array, we would replace the existing 10km exclusion zone with a 15 km exclusion zone. This means that no turbine could be constructed within a 15 km radius of the Eskdalemuir Seismic Array.

**The revised dates are currently under consideration by the Eskdalemuir Working Group (EWG) – July 2024*

6.2.3. Incorporation of MoD Technical Experts Feedback

Following the MoD subject matter expert's review of the Phase 4 and Phase 5 work packages released in 2022 refinements to the mathematical analysis used to confirm the 'headroom' within the 0.336 nm budget were undertaken. As there was a minor change in the headroom and the Seismic Impact Limit (SIL) is calculated based on the available headroom, Phase 5 was also recalculated based on the refined revisions. For details of the refinement and revision please see section5.

6.3. EKA Budget Technical Background

6.3.1. Relationship between distance and seismic impact

The amplitude of a seismic wave decreases rapidly with distance. This means that turbines built close to the EKA have a far greater impact on the seismic array and consume considerably more seismic budget. A single turbine placed on the border of the 10 km exclusion zone would have the equivalent seismic budget requirement equivalent to approximately 2,000 of the same turbines placed at a distance of 50 km (this calculation is model specific and may vary due to the make and model of the turbine). The installable capacity within the consultation zone can be maximised by avoiding placing turbines close to the EKA.

6.4. Wind Farm Specifications

6.4.1. Candidate Machine

At this stage of development, the candidate machine is not fixed, and so multiple models have been considered.

6.4.2. Wind farm specifications

Watchman Wind Farm is proposed to consist of 13 turbines each proposed to have a rated power of 7.0 MW, providing an overall capacity of 91 MW (see Table 6), with a maximum tip height of 240 m. As the current layout of the proposed Watchman Wind Farm is between 30.6 km and 32.7 km from the EKA, it is likely to be subject to a SIL, if adopted. Based on the proposed 7.0 MW turbines to be deployed at Watchman Wind Farm, the Power Seismic Value (PSV) of each turbine was calculated using equation 1 from Phase 5 (see Phase 5 report cited in section 5). As all turbines at Watchman Wind Farm are proposed to have the same power output, the PSV for each turbine is between 0.022107 nm, for a 1.0 GW SIL limit, and 0.013981 nm for a 2.5 GW SIL Limit (Table 5).

SIL Target Capacity	Power Seismic Value (PSV) for a 7.0 MW Turbine
1.0 GW	0.022107 nm
2.0 GW	0.015632 nm
2.5 GW	0.013981 nm

Table 5 – Allowable PSVs for a 7.0 MW turbine to conform with different SIL levels.

Specific turbine locations and dimensions at are shown in Table 6.

Turbine ID	Eastings	Northings	Range (km)	Hub Height (m)	Rotor diameter (m)	Power (MW)
1	295138	608020	31.51			
2	294004	608436	32.68			
3	294210	608044	32.44			
4	295198	607540	31.41			
5	294455	607687	32.16			
6	294266	607086	32.30			
7	293875	606403	32.66	155.0	170.0	7.0
8	293921	605354	32.58			
9	294582	605835	31.93			
10	295263	606185	31.26			
11	295885	606169	30.64			
12	295299	605418	31.20			
13	294650	605231	31.85			

Table 6 – Watchman Wind Farm turbine details

6.5. Definitions

In this report, the following nomenclature in Table 7 is employed for clarity:

Acronym	Definition	Notes
SIL	Seismic Impact Limit	Constant limit on seismic impact at EKA per wind turbine, relative to generation capacity. Ranges from 0.00836 nm.MW$^{-0.5}$ for 1.0 GW total deployed capacity in the ECZ to 0.00528 nm·MW$^{-0.5}$ for a 2.5 GW capacity. The level of the SIL is still a point of debate.
PSV	Power Seismic Value	The permitted seismic impact of a turbine based on its power output. (Phase 5 - Equation 1)
TMR	Turbine Mitigation Ratio	Ratio defining if mitigation is required for a turbine. TMR < 1 requires mitigation. (Phase 5 - Equation 2). Turbine with TMR ≥1 require no mitigation and have TMR listed as "not applicable" (N/A).
MoD	Ministry of Defence	UK central government department responsible for the UK's security and interests, with jurisdiction over the protection and management of the EKA.
EKA	Eskdalemuir Seismic Array	Seismological monitoring station in the Scottish Borders which forms part of the UK's obligations under the Comprehensive Test Ban Treaty (CTBT).
ECZ	Eskdalemuir Consultation Zone	The 50 km radius protected area around the EKA, within which construction of wind farms must follow formal approval procedures with the MoD and the Scottish Government.

Table 7 – Summary of acronyms used in this report relating to Seismic Impact Limit.

6.6. Methodology

6.6.1. Budget Scenarios Assessed

In order to contextualise the implications and demonstrate potential required budget levels, several scenarios have been assessed for different machines. The turbine coordinates and turbine options were coded into MATLAB, and calculations were performed to determine budget levels in line with the mathematical approaches in the reports '*SGV 203 Technical report v12.pdf*' and refined Phase 4 '*AIFCL-101-Phase4-Rev-v13': Field audit of Selected sites within the EKA Consultation Zone to support Government Policy Decisions'.*

Seismic measurements of wind turbines include ambient seismic noise. This noise is not attributed to the wind turbines themselves, rather it is produced by a combination of natural and anthropogenic sources. It has been proposed that a background noise measurement could be conducted before wind farms are built and then a subsequent measurement be conducted once the farm is operational. Budget Scenarios 9 – 16 & 18 (see below) have been included in the analysis to demonstrate the effect of performing before and after measurement in order to remove background noise. The Budget scenarios modelled are as follows;

1. Standard EKA algorithm — Using the Current MoD 'worst case' algorithm.
2. Siemens — Using Phase 4 published data
3. Senvion — Using Phase 4 published data
4. Vestas — Using Phase 4 published data
5. GE — Using Phase 4 published data
6. Nordex — Using Phase 4 published data
7. Enercon — Using Phase 4 published data
8. Gamesa — Using Phase 4 published data
9. Standard EKA background removed — See Background noise removal section
10. Siemens background removed — See Background noise removal section
11. Senvion background removed — See Background noise removal section
12. Vestas background removed — See Background noise removal section
13. GE background removed — See Background noise removal section
14. Nordex background removed — See Background noise removal section
15. Enercon background removed — See Background noise removal section
16. Gamesa background removed — See Background noise removal section
17. Siemens Gamesa 6.6-155 — Data from Manufacturer measured by XiEC
18. SG 6.6-155 Background removed — See Background noise removal section

The SG 6.6-155 (Scenarios 17 + 18) was measured outside of the Eskdalemuir region (Sweden). To correct the seismic measurements, conservative geology normalisation was applied to the measurements to translate the data to Eskdalemuir geology.

The models are scalable and can be used to predict seismic amplitudes for turbines with different dimensions and rated powers. For example, the SG 6.6-155 model may be used to predict the seismic amplitude of a SG 7.0-170 turbine by scaling the data based on the increased turbine dimensions.

6.6.2. Background Noise Removal

It is recommended that a background seismic noise measurement be conducted before the installation of wind turbines at any new wind farm; the background noise could then be subtracted from the operational noise giving a truer value of the contribution of the wind farm to seismicity. This approach is common in acoustic measurements of wind farms. To illustrate the effect that such a measurement campaign may have, tables have been provided where the noise floor has been removed from the algorithms such that the seismic contribution of the wind turbines only come from blade pass and structural resonances. This is very much a best-case scenario and is provided for illustrative purposes only. The authors note that the approach of removing all background noise from the algorithm is contrary to the precautionary approach used to design the 2014 EKA algorithm and that it is likely that some turbines generate noise which exists below the noise floor. Working through real world empirical assessments of this will provide further understanding of how close to this best-case scenario results will be. It will also inform the possible development of a methodology which will not penalise a wind turbine for noise which is not attributable to the wind turbine itself.

6.7.Seismic Budget Levels for Individual Turbines

With Background Included									
WTG No	Standard EKA Algorithm (nm)	Siemens (nm)	Senvion (nm)	Vestas (nm)	GE (nm)	Nordex (nm)	Enercon (nm)	Gamesa (nm)	SG6.6-155 (nm)
1	0.011441	0.007110	0.004995	0.007754	0.007813	0.005674	0.005370	0.010377	0.003221
2	0.010150	0.006340	0.004443	0.006913	0.006954	0.005059	0.004758	0.009271	0.002822
3	0.010405	0.006493	0.004552	0.007079	0.007124	0.005181	0.004878	0.009490	0.002900
4	0.011563	0.007182	0.005047	0.007833	0.007893	0.005732	0.005428	0.010481	0.003259
5	0.010703	0.006670	0.004679	0.007273	0.007322	0.005322	0.005019	0.009745	0.002991
6	0.010547	0.006578	0.004613	0.007171	0.007219	0.005248	0.004946	0.009612	0.002944
7	0.010175	0.006355	0.004453	0.006929	0.006971	0.005071	0.004769	0.009293	0.002829
8	0.010253	0.006402	0.004487	0.006980	0.007023	0.005108	0.004806	0.009360	0.002853
9	0.010958	0.006823	0.004788	0.007439	0.007492	0.005444	0.005140	0.009964	0.003070
10	0.011740	0.007288	0.005123	0.007948	0.008010	0.005816	0.005512	0.010632	0.003314
11	0.012524	0.007753	0.005458	0.008459	0.008528	0.006189	0.005886	0.011300	0.003562
12	0.011809	0.007329	0.005152	0.007993	0.008056	0.005849	0.005545	0.010691	0.003336
13	0.011047	0.006876	0.004826	0.007497	0.007551	0.005486	0.005183	0.010040	0.003098

Table 8 – Individual seismic Budget calculations for Watchman Wind Farm

No Background									
WTG No	Standard EKA Algorithm (nm)	Siemens (nm)	Senvion (nm)	Vestas (nm)	GE (nm)	Nordex (nm)	Enercon (nm)	Gamesa (nm)	SG6.6-155 (nm)
1	0.009153	0.005688	0.003996	0.006203	0.006250	0.004539	0.004296	0.008301	0.002576
2	0.008120	0.005072	0.003554	0.005530	0.005563	0.004047	0.003806	0.007417	0.002257
3	0.008324	0.005194	0.003642	0.005663	0.005699	0.004145	0.003903	0.007592	0.002320
4	0.009251	0.005746	0.004038	0.006267	0.006315	0.004586	0.004342	0.008385	0.002607
5	0.008562	0.005336	0.003743	0.005818	0.005858	0.004258	0.004015	0.007796	0.002393
6	0.008438	0.005262	0.003690	0.005737	0.005775	0.004199	0.003956	0.007689	0.002355
7	0.008140	0.005084	0.003563	0.005543	0.005577	0.004057	0.003815	0.007434	0.002264
8	0.008202	0.005122	0.003590	0.005584	0.005618	0.004087	0.003845	0.007488	0.002283
9	0.008767	0.005458	0.003831	0.005951	0.005994	0.004355	0.004112	0.007971	0.002456
10	0.009392	0.005830	0.004098	0.006359	0.006408	0.004653	0.004410	0.008505	0.002651
11	0.010019	0.006202	0.004367	0.006768	0.006823	0.004951	0.004709	0.009040	0.002849
12	0.009447	0.005863	0.004122	0.006395	0.006445	0.004679	0.004436	0.008552	0.002669
13	0.008838	0.005500	0.003861	0.005998	0.006041	0.004389	0.004146	0.008032	0.002478

Table 9 – Individual seismic Budget calculations for Watchman Wind Farm without background noise.

6.8.Full Individual Turbine Seismic Impact Limit Results

1.0 GW SIL		With Background Noise									Without Background Noise								
WTG No	PSV (nm)	Standard EKA TMR	Siemens TMR	Senvion TMR	Vestas TMR	GE TMR	Nordex TMR	Enercon TMR	Gamesa TMR	SG6.6-155 TMR	Standard EKA TMR	Siemens TMR	Senvion TMR	Vestas TMR	GE TMR	Nordex TMR	Enercon TMR	Gamesa TMR	SG6.6-155 TMR
1	0.022107	1.932	3.109	4.426	2.851	2.830	3.896	4.117	2.130	6.864	2.415	3.887	5.532	3.564	3.537	4.870	5.146	2.663	8.580
2	0.022107	2.178	3.487	4.976	3.198	3.179	4.370	4.647	2.384	7.834	2.723	4.358	6.220	3.997	3.974	5.462	5.808	2.981	9.793
3	0.022107	2.125	3.405	4.857	3.123	3.103	4.267	4.532	2.329	7.623	2.656	4.256	6.071	3.904	3.879	5.334	5.664	2.912	9.529
4	0.022107	1.912	3.078	4.380	2.822	2.801	3.857	4.073	2.109	6.784	2.390	3.847	5.475	3.528	3.501	4.821	5.091	2.637	8.480
5	0.022107	2.066	3.314	4.725	3.040	3.019	4.154	4.404	2.269	7.390	2.582	4.143	5.906	3.800	3.774	5.192	5.506	2.836	9.238
6	0.022107	2.096	3.361	4.793	3.083	3.062	4.212	4.470	2.300	7.510	2.620	4.201	5.991	3.853	3.828	5.265	5.588	2.875	9.388
7	0.022107	2.173	3.478	4.964	3.190	3.171	4.359	4.635	2.379	7.813	2.716	4.348	6.205	3.988	3.964	5.449	5.794	2.974	9.766
8	0.022107	2.156	3.453	4.927	3.167	3.148	4.328	4.599	2.362	7.747	2.695	4.316	6.159	3.959	3.935	5.410	5.749	2.952	9.684
9	0.022107	2.017	3.240	4.617	2.972	2.951	4.061	4.301	2.219	7.200	2.522	4.050	5.771	3.715	3.688	5.076	5.376	2.773	9.000
10	0.022107	1.883	3.033	4.315	2.781	2.760	3.801	4.010	2.079	6.671	2.354	3.792	5.394	3.477	3.450	4.751	5.013	2.599	8.338
11	0.022107	1.765	2.851	4.050	2.613	2.592	3.572	3.756	1.956	6.207	2.206	3.564	5.063	3.267	3.240	4.465	4.694	2.445	7.759
12	0.022107	1.872	3.017	4.291	2.766	2.744	3.780	3.987	2.068	6.627	2.340	3.771	5.363	3.457	3.430	4.725	4.983	2.585	8.284
13	0.022107	2.001	3.215	4.580	2.949	2.928	4.029	4.265	2.202	7.136	2.501	4.019	5.726	3.686	3.659	5.037	5.332	2.752	8.920

Table 10 – TMR for Scottish Government 1.0 GW SIL Individual Turbine – Note red denotes the SIL limit is NOT met.

Xi

2.0 GW SIL		With Background Noise									Without Background Noise								
WTG No	PSV (nm)	Standard EKA TMR	Siemens TMR	Senvion TMR	Vestas TMR	GE TMR	Nordex TMR	Enercon TMR	Gamesa TMR	SG6.6-155 TMR	Standard EKA TMR	Siemens TMR	Senvion TMR	Vestas TMR	GE TMR	Nordex TMR	Enercon TMR	Gamesa TMR	SG6.6-155 TMR
1	0.015632	1.366	2.199	3.130	2.016	2.001	2.755	2.911	1.506	4.854	1.708	2.748	3.912	2.520	2.501	3.444	3.639	1.883	6.067
2	0.015632	1.540	2.465	3.518	2.261	2.248	3.090	3.286	1.686	5.540	1.925	3.082	4.398	2.827	2.810	3.862	4.107	2.108	6.924
3	0.015632	1.502	2.407	3.434	2.208	2.194	3.017	3.204	1.647	5.390	1.878	3.009	4.293	2.760	2.743	3.772	4.005	2.059	6.738
4	0.015632	1.352	2.176	3.097	1.996	1.980	2.727	2.880	1.491	4.797	1.690	2.720	3.872	2.494	2.475	3.409	3.600	1.864	5.996
5	0.015632	1.461	2.343	3.341	2.149	2.135	2.937	3.114	1.604	5.226	1.826	2.929	4.176	2.687	2.669	3.671	3.893	2.005	6.532
6	0.015632	1.482	2.377	3.389	2.180	2.165	2.978	3.161	1.626	5.311	1.853	2.971	4.236	2.725	2.707	3.723	3.951	2.033	6.638
7	0.015632	1.536	2.460	3.510	2.256	2.242	3.083	3.278	1.682	5.525	1.920	3.074	4.388	2.820	2.803	3.853	4.097	2.103	6.906
8	0.015632	1.525	2.442	3.484	2.240	2.226	3.060	3.252	1.670	5.478	1.906	3.052	4.355	2.799	2.782	3.825	4.065	2.088	6.848
9	0.015632	1.426	2.291	3.265	2.101	2.086	2.871	3.041	1.569	5.091	1.783	2.864	4.081	2.627	2.608	3.589	3.801	1.961	6.364
10	0.015632	1.331	2.145	3.051	1.967	1.951	2.688	2.836	1.470	4.717	1.664	2.681	3.814	2.458	2.439	3.360	3.545	1.838	5.896
11	0.015632	1.248	2.016	2.864	1.848	1.833	2.526	2.656	1.383	4.389	1.560	2.520	3.580	2.310	2.291	3.157	3.319	1.729	5.486
12	0.015632	1.324	2.133	3.034	1.956	1.940	2.673	2.819	1.462	4.686	1.655	2.666	3.792	2.444	2.425	3.341	3.524	1.828	5.858
13	0.015632	1.415	2.274	3.239	2.085	2.070	2.849	3.016	1.557	5.046	1.769	2.842	4.049	2.606	2.588	3.561	3.770	1.946	6.307

Table 11 – TMR for Scottish Government 2.0 GW SIL Individual Turbine – Note red denotes the SIL limit is NOT met.

2.5 GW SIL		With Background Noise									Without Background Noise								
WTG No	PSV (nm)	Standard EKA TMR	Siemens TMR	Senvion TMR	Vestas TMR	GE TMR	Nordex TMR	Eneron TMR	Gamesa TMR	SG6.6-155 TMR	Standard EKA TMR	Siemens TMR	Senvion TMR	Vestas TMR	GE TMR	Nordex TMR	Eneron TMR	Gamesa TMR	SG6.6-155 TMR
1	0.013981	1.222	1.966	2.799	1.803	1.790	2.464	2.604	1.347	4.341	1.528	2.458	3.499	2.254	2.237	3.080	3.255	1.684	5.427
2	0.013981	1.378	2.205	3.147	2.023	2.011	2.764	2.939	1.508	4.955	1.722	2.756	3.934	2.528	2.513	3.455	3.674	1.885	6.193
3	0.013981	1.344	2.153	3.072	1.975	1.962	2.699	2.866	1.473	4.821	1.680	2.692	3.839	2.469	2.453	3.373	3.583	1.842	6.026
4	0.013981	1.209	1.947	2.770	1.785	1.771	2.439	2.576	1.334	4.291	1.511	2.433	3.463	2.231	2.214	3.049	3.220	1.668	5.363
5	0.013981	1.306	2.096	2.988	1.922	1.909	2.627	2.786	1.435	4.674	1.633	2.620	3.735	2.403	2.387	3.284	3.482	1.793	5.842
6	0.013981	1.326	2.126	3.031	1.950	1.937	2.664	2.827	1.455	4.750	1.657	2.657	3.789	2.437	2.421	3.330	3.534	1.818	5.937
7	0.013981	1.374	2.200	3.139	2.018	2.006	2.757	2.932	1.505	4.941	1.718	2.750	3.924	2.522	2.507	3.446	3.664	1.881	6.177
8	0.013981	1.364	2.184	3.116	2.003	1.991	2.737	2.909	1.494	4.900	1.705	2.730	3.895	2.504	2.489	3.421	3.636	1.867	6.125
9	0.013981	1.276	2.049	2.920	1.879	1.866	2.568	2.720	1.403	4.554	1.595	2.562	3.650	2.349	2.333	3.210	3.400	1.754	5.692
10	0.013981	1.191	1.919	2.729	1.759	1.745	2.404	2.536	1.315	4.219	1.489	2.398	3.412	2.199	2.182	3.005	3.171	1.644	5.274
11	0.013981	1.116	1.803	2.561	1.653	1.639	2.259	2.375	1.237	3.926	1.395	2.254	3.202	2.066	2.049	2.824	2.969	1.547	4.907
12	0.013981	1.184	1.908	2.714	1.749	1.736	2.390	2.521	1.308	4.192	1.480	2.385	3.392	2.186	2.169	2.988	3.152	1.635	5.239
13	0.013981	1.266	2.033	2.897	1.865	1.852	2.548	2.698	1.393	4.513	1.582	2.542	3.621	2.331	2.314	3.185	3.372	1.741	5.641

Table 12 – TMR for Scottish Government 2.5 GW SIL Individual Turbine – Note red denotes the SIL limit is NOT met.