EIA: Supplementary Environmental Information

Sandy Knowe Wind Farm Extension

SEI Chapter 3: Revised Peat Management Plan (PMP)

Sandy Knowe Wind Farm Limited

October 2023

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This report also is supported by the following Appendices associated with the 2022 EIA:

Technical Appendix 8-2 Peat Management Plan (PMP)

Technical Appendix 14-2 Outline Habitat Management Plan (OHMP)

Glossary of Terms

Term	Definition
The Applicant	Sandy Knowe Wind Farm Limited
The Agent	ERG Holding UK Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development.
Environmental Impact Assessment Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations)
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Proposed Development	The Sandy Knowe Wind Farm Extension
The Proposed Development Footprint	The area within which the Proposed Development will be located
The Proposed Development Site	The full application boundary including Sandy Knowe Wind Farm and Sandy Knowe Wind Farm Extension

List of Abbreviations

Abbreviation	Description
EIA	Environmental Impact Assessment
EnvCoW	Environmental Clerk of Works
GWDTE	Ground Water Dependant Terrestrial Ecosystems
NPF4	Fourth National Planning Framework
NVC	National Vegetation Classification
OHMP	Outline Habitat Management Plan
PMP	Peat Management Plan
SEI	Supplementary Environmental Information
SKWF	Sandy Knowe Wind Farm

3 Introduction

3.1 Background

The Peat Management Plan (PMP) for the Proposed Development was presented as Volume 2 Technical Appendix 8-2 of the 2022 EIA (referred to hereafter as the 2022 PMP). The PMP summarised the estimated peat excavation volumes (both permanent and temporary) associated with construction of the wind farm infrastructure and provided reuse proposals for this material alongside good practice measures for the excavation, storage and reuse of peat.

The 2022 PMP indicated that, due to lack of suitable alternative uses for peat within the Proposed Development footprint, the main borrow pit used for the now operational Sandy Knowe Wind Farm (SKWF) and intended to support the Proposed Development provided the best option for peat reuse and preservation of peat physical condition and overlying habitat. Sections 3.3 ('Peat Geomorphology and Condition'), 3.4 ('Drainage') and 3.5 ('Land Use') of the submitted 2022 PMP indicated an absence of eroded bare peat or hagged areas, that artificial drains were of insufficient dimensions for peat placement, and that there were no other artificial features (e.g. peat cuttings) within which peat could be reinstated.

In their consultation response (SEI Appendix 1-1 SEPA Ref 6247), SEPA provided the following advice on disturbance and reuse of excavated peat:

i. That the suitability of the borrow pit for reinstatement be confirmed in relation to its location relative to the presence of peat in the surrounding area.

ii. That details of the approach to, and sequencing of, borrow pit reinstatement proposals be provided.

iii. That consideration be given to alternative reuse options for peat and to further measures to reduce overall impacts.

NatureScot's consultation response (NatureScot Ref: CDM168091) noted:

iv. That restoration proposals (i.e. borrow pit reinstatement) did not adequately compensate for the level of disturbance arising from the proposal and recommended 'more ambitious targets for peatland restoration'.

This SEI chapter attends to iii. and iv. above, while SEI Chapter 4 addresses i. and ii.

The need for and approach to peat reuse depends upon the total volume of peat surplus generated during construction and therefore point iii. is considered firstly in terms of reducing impacts and secondly in terms of reuse proposals.

The approach to iv. is addressed by definition of specific peatland restoration areas, partially in response to NatureScot's consultation response but also in response to new guidance issued in June 2023 (NatureScot, 2023).

Note that much of the 2022 PMP remains unchanged (as the layout footprint has not been altered) and therefore this Revised PMP (RPMP) highlights any changes from the previous submission, and states clearly how these supersede the original PMP.

3.2 Reducing Impact

3.2.1 Original Layout Design

The Proposed Development layout was reached through an iterative design process that balanced all site constraints, including peat depth and the quality of overlying habitats.

Section 2.3.1 ('Prevent') of the 2022 PMP detailed specific design decisions made to minimise impacts on peat, however, the extensive cover of peat across the Proposed Development footprint precluded complete avoidance by turbines and hardstandings while the relatively steep slopes dropping towards the numerous watercourses draining the Site generated practical limitations to track routing.

Furthermore, the prevailing slope towards the north limited the suitability of peat areas for floating track construction, and therefore this construction method was identified for the deepest area of peat only between Turbines T27 and T28.

3.3 Revisiting Layout Design

3.3.1 Approach

Subsequent to submission of the EIA, turbine positions, track alignments and construction approaches were revisited to determine suitability for further impact reduction. As a result:

- The layout remained unchanged since the submitted layout was still considered optimal with respect to site conditions.
- Construction approaches were reconsidered for tracks in areas of the site with very gentle slopes, focusing on the vicinity of proposed Turbines T29 and T30.

SEI Figure 3-1 shows revised proposals for track construction in the T29 / T30 area. Floating track has been specified where peat is present, noting that gradients are sufficiently low here to enable construction with minimal associated ground risks.

The saving in permanent peat excavation has been calculated by deducting the volume calculations from the relevant track sections in recognition that no excavation would be required. Details on calculation approach are provided in SEI Chapter 4 of the 2022 PMP and are not repeated here.

Additional review was undertaken for potential floating track sections in the southwest of the Proposed Development, between the constructed Sandy Knowe Wind Farm and Turbine T25 and as extensions of the existing section between T27 and T28.

- In the case of the former, cross-track gradients exceeded 5° over the majority of the deep peat area and therefore a change in construction methodology was rejected.
- For the latter, a change in methodology was also rejected due to the need to construct watercourse crossings and the proximity to ancillary crane hardstandings for both T27 and T28 (which would require transition from floating to cut and fill). Taken together, the transitions for crane hardstandings and watercourse crossings would limit the floating section lengths to <100 m making then non-viable (since

floating / cut and fill transition pieces are lengthy and use up much of the 100 m length for each change in construction approach).

All other track lengths were subject to the same slope / peat depth constraint and no further opportunities to reduce cut and fill tracks could be identified.

3.3.2 Reduced Impact

The new floating track section is c. 500 m in length and gives a saving of c. 3,000 m³ of permanent peat excavation, of which c. 250 m³ is acrotelmic peat and 2,750 m³ is catotelmic peat (Table 3-1).

Table 3-1: Revised peat excavation volumes for all infrastructure (modified from Table 4.1 in submitted PMP)

		Excavation Volume (m³)		
Infrastructure	**Type of Excavation**	**Acrotelm**	**Catotelm**	**Total**
Access Tracks	Permanently excavated	3,926	9,402	13,328
Turbine foundations	Permanently excavated	293	421	714
Main hardstandings	Permanently excavated	1,191	1,658	2,849
Permanent excavation total		**5,410**	**11,481**	**16,891**
Blade laydowns	Temporarily excavated	70	90	160
Turning heads	Temporarily excavated	447	829	1,276
Boom assemblies	Temporarily excavated	261	521	782
Temporary excavation total		**778**	**1,440**	**2,218**
Total peat excavation		**6,188**	**12,921**	**19,109**

The change results in an overall reduction of permanently excavated peat to c. 16,890 m³ from c. 19,890 m³ in the 2022 PMP, i.e. a 16% decrease in impact. There is no net change in habitat impacted however since in either case, the habitats along the track alignment would be impacted either by displacement (in the case of the former cut and fill approach) or by covering (by floating track).

3.3.3 Alternative Reuse Options

In order to clarify the suitability of the borrow pit ('Borrow Pit D') for reuse, further peat depth probing and survey were undertaken in August 2023 in the vicinity of the as-constructed pit, and post-reinstatement topographic data were used to understand the baseline for further reuse of the pit for peat reinstatement. This is detailed in Chapter 4 of the SEI. Other reuse options had already been excluded (as noted in section 3.1 of this chapter).

Based on the additional surveys, the borrow pit remains the best option for peat reuse, and the full revised volume of 16,891m³ of peat is to be reinstated in the pit.

3.4 Peatland Restoration

3.4.1 Context

Recent NatureScot (2023) guidance indicates that where proposed infrastructure overlaps with 'peatlands', restoration should be undertaken to offset direct and indirect impacts. Objective 4 of the 2022 Outline Habitat Management Plan (OHMP) (EIA Volume 2 Appendix 14-2) was to undertake '*peatland restoration/ditch blocking, where appropriate*'. The proposals indicated that the drains to be blocked would be selected by the Environmental Clerk of Works (EnvCoW) and the Applicant (i.e. post-consent), however no indicative areas or total drain lengths were provided. For this SEI, further definition has been provided for Objective 4 of the 2022 OHMP to provide confidence in the suitability and scale of proposals for this restoration measure.

3.4.2 Identifying Direct and Indirect Impact

In order to determine the degree of overlap with peatland habitats and provide an indication of scale of compensatory works that might be appropriate, the extent of overlap of the Proposed Development infrastructure with peatlands was determined.

A National Vegetation Classification (NVC) survey for the Proposed Development described, in detail, the vegetation communities present across the Site, including peatland communities. In general terms, the following communities observed at the Site have been used, alongside peatland, to identify the extent of direct impact from the construction footprint and indirect impact calculated as a 10 m buffer for hydrological / habitat disturbance:

- M15 (where present on peat);
- M25 (where present on peat);
- M20;
- M25 / M20 mosaic; and
- M20 / M15 mosaic.

Any areas of peat (i.e. >0.5 m) without these habitats are also considered to be peatland, with the potential to be restored to peatland habitat if not already present.

SEI Figure 3-2 shows these habitats and/or peat where present within the direct and indirect impact zones of proposed infrastructure. The total direct impact is c. 1.65 ha and indirect impact is 3.91 ha (totalling 5.56 ha).

3.4.3 Proposed Restoration

In order to identify drains appropriate for blocking, all drains present within the Proposed Development footprint were mapped using a combination of bing.com and GoogleEarth™ satellite imagery. Drain lengths were calculated and 10 m buffers were applied to each drain to identify an indicative zone of benefit from drain blocking (within which water tables would be expected to recover). The 10 m buffer was selected to match the indirect impact buffer, in line with NatureScot guidance recommendations. Where thin 'slithers' of unbuffered ground were evident, these were incorporated within the buffer footprint, as were areas enclosed on three sides by

drains, within which there would be expected to be some benefit from blocking. The drains and buffers are shown on SEI Figure 3-3.

These drains and buffers were reviewed against a series of constraints:

i. GWDTE;

ii. Slope angle;

iii. Other habitat management measures;

iv. Peat depth.

Chapter 8 Hydrology, Hydrogeology and Soils of the 2022 EIA assessed for the presence of GWDTE and presented 'assessed GWDTE' within 100 m or 250 m of proposed excavations. In the western turbine cluster of the Proposed Development (Turbines T28 to T25), predominantly Low-Moderately dependent GWDTE were identified west of Turbines T25 to T28, while to the east of the access track linking these turbines Moderately dependent GWDTE were identified. In the eastern turbine cluster, an area of Moderately dependent GWDTE was identified between Turbine T30 of the Proposed Development and Sandy Knowe Wind Farm turbine T17, with otherwise Low-Moderate or Low dependent GWDTEs elsewhere.

Groundworks for drain blocking are typically undertaken using low ground pressure plant in order to minimise damage to terrestrial habitats and prevent stranding in peat with low bearing capacity. Activities with the potential to change the groundwater flow regime to these environments were listed in section 8.4.5 of the EIA as:

- Barrier effect to groundwater flow from sub surface foundations and excavations and access road;
- Diversion of groundwater flow due to dewatering from excavations;
- Increased hardstanding causing reduction in local recharge, and diversions of shallow groundwater and; and
- Drainage cut offs and temporary and permanent drainage.

Low ground pressure plant movements are considered unlikely to have any effect on the viability of GWDTEs, and instead would act to benefit groundwater recharge of surface ecosystems by slowing the flow of water from drained areas and encouraging a return to pre-drained conditions. As a conservative measure, only drains within Low-Moderate or Low groundwater dependency areas are proposed for groundworks.

Slope angle may preclude the safe operation of plant, particularly above watercourses. Areas with gradients in excess of 10° towards watercourses and 15° (on any axis) have also been excluded from proposed drain blocking proposals, as have all drains within 25 m of watercourses.

Areas of habitat management are proposed for black grouse in the eastern turbine cluster (as shown in Figure 14-2-1 of the 2022 EIA) and drains in these areas are also excluded from blocking proposals.

After drains in areas of constraint have been removed from blocking proposals, the following drain lengths and areas of potential benefit have been calculated:

Western turbine cluster (T25 to T28) of the Proposed Development:

- 11.48 km of drains– approximately 1 km of drains fall in constrained areas;

- 16.23 ha of buffered or benefitting area (of which 14.2 ha is in peat);

Eastern turbine cluster (T29 and T30) of the Proposed Development:

- 9.15 km of drains – approximately 0.85 km of drains fall in constrained areas;
- 18.17 ha of buffered benefitting area (of which 4.9 ha is within peat).

The total restoration benefitting peatland areas is 19.1 ha, compared with 5.56 ha of impact. For context, c. 6.6 ha of additional habitat is to be created for black grouse (all in the eastern turbine cluster).

This restoration complements proposals within the HMP for the main Sandy Knowe Wind Farm area, which also aims to block drains and elevate water tables.

3.5 Suitability of Proposals given NPF4

NPF4 was adopted in February 2023 and provides a series of planning policies aimed at enabling new infrastructure developments to help in reducing emissions and adapt to the long-term impacts of climate change. Policy 5: Soils and Policy 11: Energy apply to peat (soil) management and renewables schemes.

A discussion of how the Proposed Development aligns with these policies is presented in the SEI Planning Statement (2023 Update).

3.6 References

Gilmour D, Jorat E, Minto A and Tierney I (2022). Effectiveness of construction mitigation measures to avoid or minimise impact to groundwater dependent wetlands and to peat hydrology. Available online at: crew.ac.uk/publications

NatureScot (2022) Consultation Response dated 13/10/22, Ref CDM168091 . 7p

NatureScot (2023) Advising on peatland, carbon-rich soils and priority peatland habitats in development management. Available online at: https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management