

Hollandmey Renewable Energy Development

Technical Appendix 15.1: Forestry

November 2021

Contents

1.	Introduction	1
2.	Legislation, Policy and Guidance	1
2.1	National	2
2.2	Local	5
2.3	Forest Plans	5
3.	Baseline Conditions	5
3.1	Forestry Study Area	5
3.2	Existing Forest Plan	6
3.3	Site Visit	8
4.	Windfarm Forest Plan	30
4.1	Felling	30
4.2	Windfarm Felling Plan	31
4.3	Windfarm Restocking Plan	43
5.	Requirement for Compensatory Planting	44
6.	Forestry Waste	44
7.	Forestry Management Practices	46
7.1	Harvesting Method	46
7.2	Aftercare Works	47
7.3	Standards and Guidelines	47
8.	Summary	47
9.	References	47

Appendices:

Appendix 1 - Site Layout and Survey Locations for Site Visit	48
Appendix 2 - Forest Gales Results Table	50
Appendix 3 - Harvesting Method	51

1. Introduction

This Technical Appendix of the Hollandmey Renewable Energy Development (RED) (hereafter the proposed Development) Environmental Impact Assessment (EIA) Report evaluates the potential effects on the woodland resource. This assessment was undertaken by Scurrah Associates Limited on behalf of RSK ADAS.

The proposed Development (as shown in EIA Report Figure 3.1 Site Layout Plan) lies within existing commercial forestry plantations. The forestry is privately owned and is managed by RDS Forestry.

Forestry is not being regarded as a receptor for EIA purposes. Commercial forests are dynamic and their structure continually undergoes change due to normal felling and restocking by the landowner; natural events, such as windblow, pests or diseases; and external factors, such as a windfarm development.

This appendix identifies the forestry proposals that have been developed to identify areas of forest to be removed for the construction and operation of the proposed Development and outlines the proposed management practices, while identifying the likely restocking proposals and future land management of the remaining forest. The responsibility for the management of the remainder of the forest outwith the proposed Development lies with the landowner and therefore the wider felling operations, restocking, and aftercare operations do not form part of the proposed Development for which consent is sought. The forestry proposals have been developed to:

The forestry proposals are interrelated with environmental effects, which are assessed separately. This appendix should be read in conjunction with the following EIA Report chapters as they are interrelated to the changes in the forest structure:

- Chapter 2: Site Description and Design Evolution;
- Chapter 3: Description of the Proposed Development;
- Chapter 7: Landscape and Visual Impact Assessment;
- Chapter 8: Ecology and Biodiversity; and
- Chapter 9: Ornithology; and
- Chapter 10: Hydrology, Hydrogeology, Geology and Soils.

In general, throughout this Technical Appendix data labelled "baseline" refers to the current crop composition and any existing plans without any modification as a result of the proposed Development. Data labelled "Renewable Energy Development" refers to the forestry plans incorporating the proposed Development.

2. Legislation, Policy and Guidance

Relevant overarching planning policies for the proposed Development are detailed within the Planning Statement that accompanies the application. A desktop study was undertaken drawing upon published National, Regional and local level publications, assessments and guidance to establish the broad planning and forestry context within which the proposed Development is located.

Forestry related policies and documents listed below have been considered within the forestry assessment. The following section provides an outline of those planning policies which are relevant to the proposed Development and in particular to forestry.

2.1 National

Scottish Forestry Strategy 2019-2029

The Scottish Forestry Strategy (SFS) is the Scottish Ministers' framework for taking forestry through the first half of this century and beyond. The SFS sets out the following commitments:

- to increase Scotland's woodland cover to 21% by 2032;
 - 12,000 ha per year from 2020/21;
 - 14,000 ha per year from 2022/23; and
 - 15,000 ha per year from 2024/25.
- increase the contribution of forests and woodland to Scotland's sustainable and economic growth;
- improve the resilience of Scotland's forests and woodlands and increase their contribution to a healthy and high-quality environment; and
- increase the use of Scotland's forest and woodland resources to enable more people to improve their health, well-being and life chances.

The Land Use Strategy for Scotland 2016-2021

The Scottish Land Use Strategy is a strategic framework for achieving the 'best' use from Scotland's land resource. It aims to achieve a more integrated approach to land use, maintaining the future capacity of the land resource and is based on the three pillars of sustainability: economy, environment and communities. Attaining multiple benefits from land is a key theme, and the focus on forestry is the identification of areas best for tree planting in an integrated land use system. To increase its role in addressing the challenge Scotland faces from climate change, a target of 100,000 ha of new woodland creation between 2012 - 2022 has been established. Regional Forestry and Woodland strategies developed by local authorities are identified as the delivery mechanism to promote good practice and multi benefit land use.

Scottish Planning Policy (2014)

Trees and woodlands are addressed in the Scottish Planning Policy (SPP), which recommends local authorities prepare woodland strategies to support the development of forestry and woodlands in their area (Section 201). The opportunities for woodland creation are highlighted in Section 217, along with the need for the Control of Woodland Removal (CWR) Policy to be taken into consideration in relation to any development (Section 218), stating woodland removal should only be permitted where it would achieve significant and clearly defined additional public benefits. Where woodland is removed in association with development, developers would generally be expected to provide compensatory planting.

National Planning Framework for Scotland (2014)

The National Planning Framework for Scotland 3 (NPF3) acknowledges the economic value of woodlands and forestry in addition to their ecological value. NPF3 details the national woodland expansion target of 10,000 ha per annum from 2015 with a subsequent review of woodland expansion targets in the 2020s to ensure national objectives on omissions and land use are achieved. This target has been superseded by the targets in the SFS.

Scotland's Fourth National Planning Framework Position Statement

When completed, The National Planning Framework 4 (NPF4) will set out a new plan for Scotland in 2050. This interim position statement states the following policy in relation to forestry:

“Strengthening policy on woodland protection and creation in association with development, aligned with new provisions on forestry and woodland strategies”.

NPF4 will doubtless provide further detail and any changes in national targets.

Forestry and Land Management (Scotland) Act (2018)

The ability of woodlands to sequester carbon, and hence their role in possible mitigation of climate change is an important factor in shaping regulatory mechanisms. The felling of trees is regulated under the Forestry and Land Management (Scotland) Act 2018. Woodland removal, defined as "the permanent removal of woodland for the purposes of conversion to another land use" falls within the scope of the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017, except in cases when woodland removal is associated with windfarm development. In such cases, any significant environmental effects of woodland removal are assessed by the Scottish Government or the Local Authority depending on the capacity of the development.

Control of Woodland Removal Policy (CWR) (2009)

Forestry Commission Scotland (now Scottish Forestry) issued a document entitled 'The Scottish Government's Policy on Control of Woodland Removal' (2009) and accompanying Implementation Guidance (2019) (Appendix A), which provides guidance on the CWR and process for managing the implementation of the CWR Policy in respect of forestry removal on development sites. The principle aims of the CWR Policy are to provide a strategic framework for appropriate woodland removal and to support climate change mitigation and adaptation. The CWR Policy is built on the following principles:

- a strong presumption in favour of protecting Scotland's woodland resource;
- woodland removal should be allowed only where significant and clearly defined additional public benefit can be demonstrated. A proposal for compensatory planting may add additional public benefit;
- approval for woodland removal should be conditional on the undertaking of actions to ensure full delivery of the defined additional public benefits;
- planning conditions and agreements are used to mitigate the environmental impacts arising from development and SF would also encourage their application to development related woodland removal; and
- where felling is permitted but woodland removal is not supported, conditions conducive to woodland regeneration should be maintained through adherence to good forestry practices as defined in the UK Forestry Standard (revised 2017) (UKFS).

The CWR Policy identifies the following criteria for areas where woodland removal may occur without a requirement for compensatory planting:

- enhancing priority habitats and their connectivity;
- enhancing populations of priority species;
- enhancing nationally important landscapes, historic environment and geological Sites of Special Scientific Interest (SSSI);
- improving conservation of water resources;
- improving conservation of soil resources; and
- public safety.

Woodland removal with compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- helping Scotland mitigate and adapt to climate change;
- enhancing sustainable economic growth or rural/community development;
- supporting Scotland as a tourist destination;
- encouraging recreational activities and public enjoyment of the outdoor environment;
- reducing natural threats to forests or other land; or
- increasing the social, economic or environmental quality of Scotland's woodland cover.

UK Forestry Standard

The overarching document for forestry management is the UKFS. It is the reference standard for sustainable forest management in the UK. UKFS outlines the context for forestry, sets out the approach of the UK governments to forestry, defines standards and requirements and provides a basis for regulation and monitoring – including national and international reporting. UKFS's approach is based on applying criteria agreed at international and European levels to forest management in the UK. It has been endorsed by the UK and country governments and applies to all UK forests and woodlands. In its sustainable forest management guidelines with respect to climate change and soil, it advises that forest managers consider the balance of benefits of carbon and other ecosystem services before making the decision to restock on soils with peat depths exceeding 50 centimeters (cm). In general, there is a strong presumption against woodland removal, and restocking of harvested forests is a normal condition of felling approval being granted.

UKWAS 4 2018

The UK Woodland Assurance Standard (UKWAS) is an independent certification standard for verifying sustainable woodland management in the UK that is used for both Forest Stewardship Council® (FSC®) and the Programme for the Endorsement of Forest Certification (PEFC) certification.

The UK Woodland Assurance Standard (UKWAS) was developed by a multi-stakeholder partnership with the first edition launched in 1999. Primarily, the certification standard is designed to reflect the requirements set out in the governmental UK Forestry Standard and thereby the General Guidelines adopted by European Forestry Ministers at Helsinki in 1993, the Pan-European Operational Level Guidelines (PEOLG) subsequently adopted at Lisbon in 1998 and other relevant international agreements.

In response to the demand from the UK forestry and forest products sector, the certification standard is also designed to reflect the requirements of the two leading global forest certification schemes – the Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC). Products certified through these schemes are in much demand in the UK and global timber market as they provide a widely recognised way to inform customers that timber products come from responsibly managed sources.

Forestry Commission (1996) Technical Paper 16: Designing Forest Edges to Improve Wind Stability

Forest edges are important for the stability, visual impact and biodiversity of forests. Wind tunnel measurements suggest that trees at established forest edges are inherently more stable than trees within the forest because their form will have adapted to the increased wind exposure. On the other hand, recently exposed edge trees will be much more vulnerable because of their lack of adaptation. Experiments were carried out in the wind tunnel on five different edge treatments and show that tapered edges and those with a gradation in tree density have potential stability benefits for both new edges and trees inside an established edge. However, a low shrub layer placed just in front of the forest edge increased the wind loading on the edge trees and reduced their stability. Practical methods for creating edges that can improve forest stability and visual appeal are discussed in the paper.

Forestry Commission (2016) Forest Yield: A handbook for forest growth and yield tables for British forestry

Yield models are one of the foundations of forest management. They provide information about the patterns of tree growth and potential productivity that can be expected in forest stands of different tree species, with varying growth rates, when managed in different ways. Yield models are in daily use by forest managers and practitioners when making decisions about the future management of a forest – whether it is an individual stand of trees or a whole estate. They are also

applied when forecasting future levels of production, when making commitments to supply timber markets, and for planning and scheduling forest operations.

2.2 Local

The Highland Council (2018) Highland Forest and Woodland Strategy (HFWS)

The HFWS is one of a series of Supplementary Guidance documents prepared by The Highland Council to support its Highland-wide Local Development Plan (2012). At the broadest strategic level, the purpose of the HFWS is to provide a regional expression of how the national vision and priorities for the protection and expansion of Scotland's forest and woodland resource - as set out in the Scottish Government's Land Use Strategy for Scotland (2012), Scottish Forestry Strategy (2006) and other related Strategies - will be achieved within the context of the Highlands. More specifically, the purpose of the HFWS is to provide The Highland Council with the framework for consulting on applications for grant support for woodland creation and management in support of the existing regulatory and environmental protection processes, most notably the UK Forestry Standard.

The Highland Council (2013) Trees, Woodlands and Development supplementary guidance

This Supplementary Guidance reflects the policy advice given in the Council's Highland wide Local Development Plan¹ under Policy 51 Trees and Development and Policy 52 Principle of Development in Woodland. The purpose of this Supplementary Guidance is to ensure that applicants seeking planning permission effectively consider and subsequently manage existing trees and woodlands, as well as identifying opportunities for planting and management of new trees and woodlands. This enables planners to make quicker, efficient and more consistent decisions.

2.3 Forest Plans

A Forest Plan relates to individual forests or groups of woodlands. It describes the woodlands, places them in context with the surrounding area, and identifies issues that are relevant to the woodland or forest. Forest Plans describe how the long-term strategy would meet the management objectives of the owner, the criteria of the UKFS and the UKWAS, under which the woodlands would be managed if certificated.

The Forest Plan covers all aspects, such as conservation, archaeology, landscape and the local community in addition to forestry and silvicultural considerations to deliver long term benefits through sustainable forest management. Restructuring of age class and species are important factors in this process to ensure proposals meet the current standards. The current guidelines require diversification of species and woodland types as part of the forest planning process, specifically an increase in the proportion of broadleaf woodland, other conifers, and open ground.

If the proposed Development were approved, an amendment to the long-term forest plan would need to be submitted to Scottish Forestry for approval. A Renewable Energy Development Forest Plan is prepared along the same principles as a standard Forest Plan, with the relevant information, such as details of site infrastructure and environmental baseline data, being provided by other members of the project team.

3. Baseline Conditions

3.1 Forestry Study Area

The Site extends to 1149 ha and is comprised largely of mid-rotation commercial forestry plantations. There is also a considerable amount of open moorland intermixed with the plantations. In the northern part of the woodland there is also some areas of wet woodland, upland birchwood and acid grassland, some used for grazing, and the Site also includes the Phillips Mains Mire SSSI

designated for its blanket bog habitat. It lies within Scottish Forestry's Highlands and Islands Conservancy. The Site is split over two landholdings. The forestry that would be affected by the proposed Development is located entirely within one landholding; therefore, the forestry study area is limited to the extent of this landholding.

3.2 Existing Forest Plan

The forestry plantations within the study area are managed by RDS Forestry and are currently covered by a Long Term Forest Plan, re: 17GS18237, approved by Scottish Forestry (SF) on 10 July 2019.

The plan shows the areas of felling and thinning that the landowner intends to carry out over the first 10-year period and would like approval with outline proposals for a further 10 years to provide a total 20 year period. Restocking proposals are also included and must cover the whole forest so that the proposals can be assessed against the requirements of the UKFS. Once the plan is approved, the agreed thinning and felling for the first 10 years can be carried out without the need to apply for felling licenses.

The plantations are also within the UKWAS. The following historical Woodland Grant Scheme (WGS) applications were made in relation to the study area:

- WGS2 Application made in 1993 on behalf of Phillips Mains covering the northern section. This application was approved for woodland establishment;
- WGS2 Application made in 1994 on behalf of Phillips Mains (property name) covering the north east section that surrounds the SSSI. This application was for "approved re-stocking and/or management"; and
- WGS3 Application made in 1995 on behalf of Phillips Mains covering the southern section. This application was also for woodland establishment.

Planting Year/Age Class Structure

Figure 15.2 of the EIA Report shows that the main plantings were carried out in 1994 and 1995, so most of the plantations are now aged 25 and 26 years old, roughly mid-way through their financial rotation. As the main plantations are only 25 and 26 years old, they will not reach the age when they are normally felled (when they reach Maximum Mean Annual Increment (MMAI)) for another 30-40 years. Sitka Spruce Yield Class (YC) 16 would reach MMAI at age 55yrs and Lodgepole Pine YC 10 would reach MMAI at age 60-65yrs, so there is likely to be very little clear felling planned for at least 30 years.

Species Composition

The study area is made up of 30 compartments and 602 sub compartments. 513 of the sub compartments are comprised of trees and the rest are areas of open ground or other land. The commercial forestry plantations are comprised of:

- 62.74 ha of Sitka Spruce;
- 351.61 ha of mixed Sitka Spruce and Lodgepole Pine; and
- 71.07 ha of Lodgepole Pine.

There is also 10.59 ha of native broadleaves intermixed with some open ground and 4.69 ha of woodland grazing. Figure 15.1 of the EIA Report shows the site layout in relation to the baseline species plan.

Timber Size and Quality

Based on YC 16 the Sitka Spruce (on average) has a top height of 12.8 m, a mean diameter of 13.5 cm and a standing volume of 184 m³/ha.

Based on YC 10 the Lodgepole Pine has an average top height of 11.6 m, a mean diameter of 12 cm and a standing volume of 152 m³/ha. Top height is defined as the average height of the 100 largest girth trees per hectare.

Based on these YCs, the mixed plantations will have a top height similar to the Sitka Spruce but an average diameter of 12-13.5 cm and a standing volume between 152 m³/ha and 184 m³/ha depending on the proportions of the two species.

The quality of the timber is typical for upland plantations of these species and age. Most of the sub-compartments are reasonably productive, but there are also some sub compartments where the trees are stunted and the stocking is variable.

Baseline Felling Plan

The baseline felling plan forms part of the current Forest Plans prepared by the forest managers. The baseline felling plan is illustrated in Figure 15.3 and presented in **Table 1** below. An area of forestry to the northeast of the study area was felled in 2020 so this area has not been included in either **Figure 15.3** or **Table 1**.

Table 1: Baseline felling plan

Baseline Felling Plan		
Fell Phase	Area (ha)	Area (%)
Phase 1: 2018-2022	49	6.5
Phase 2: 2023-2027	58.8	7.8
Phase 3: 2028-2032	176.5	23.5
Phase 4: 2033-2037	146.6	19.5
Conifer Long-term Rotation	7.3	1
Natural Reserve	8.1	1.1
Open Ground	7.8	1
Other Land	101.3	13.5
Woodland Grazing	196.2	26.1
Total	751.7	100%

Areas have been designated as Natural Reserves (NR). These are areas which are considered of high conservation interest or potential and are managed by minimum intervention unless alternative management has higher conservation or biodiversity value.

Other areas of crop in the baseline felling plan have been assigned a delayed felling period. These areas are Long Term Retentions: crops to be retained beyond their age of economic or silvicultural maturity for conservation and biodiversity purposes. These Woodlands would otherwise be managed as normal and would in due course be felled and replanted. The identification of LTRs and NRs is part of the requirements of UKWAS and the UKFS.

Baseline Restocking Plan

When plantations reach the end of their financial rotation and are felled, this provides an opportunity to change the species and/or the land use. The baseline restocking plan is shown in **Table 2**. The key long-term changes are as follows:

- the restocking would be mainly with pure Sitka Spruce, as RDS Forestry are confident this would give the best economic result;
- there would be no mixtures of Sitka Spruce and Lodgepole Pine planted;
- pure stands of Lodgepole Pine would continue to be re-planted on the poorest sites;
- there would be an increase in the area of open land which is mainly as a result of consultation with NatureScot in relation to expanding the SSSI buffer zone;
- the additional area of conifer long term retention is needed to comply with UKWAS;
- some areas (designated as Woodland Grazing) are being converted to arable and improved grassland; and
- compartment 30 was also never planted due to the peat cutting rights.

Table 2: Baseline restocking plans

Species/Land Use Code	Land Use Description	Current Area (ha)	Restocking Area (ha)
SS	Sitka Spruce	62.74	358.65
SS/LP	Sitka Spruce / Lodgepole Pine Mixture	351.61	0.00
LP	Lodgepole Pine	71.07	65.42
NBL	Native Broadleaves	2.39	20.71
NBL/OG	Native Broadleaves / Open Ground	8.20	8.10
CON/LTR	Conifer / Long Term Retention	0.00	7.29
OL	Other Land	0.00	19.88
WDG	Woodland Grazing	0.00	12.75
NR	Nature Reserve	0.00	7.76
OG	Open Ground	0.00	0.14

3.3 Site Visit

Site visit was undertaken on 4 August 2020. The weather provided no constraint to visibility until 2pm in the afternoon, thereafter heavy rainfall and wind was experienced for the rest of the day.

Survey Methodology

The site survey was undertaken on 4 August 2020 by foot to inform design iteration and the assessment of effects. The survey covered all parts of the forest within the application boundary, as shown in **Appendix 1**. All inspections were made from ground level and no climbing of trees or structure was undertaken. GPS locations were selected to cover the approximate areas of the proposed turbine and solar array locations. A figure of the site layout at the time of the site visit is

shown in **Appendix 1**. This represented an earlier iteration of the layout and included all of the potential solar locations. One solar location was outwith the application boundary as it was being investigated whether it would be feasible to extend the application boundary to cover an additional area to the north east. Photographs were taken at each location to show the current forest structure.

The survey assessment was limited to a preliminary site assessment to walk and survey the forest focusing on the proposed wind turbine sites and solar locations within the time allowed onsite of 1 day.

Observations

Turbine 1

Crop currently undergoing drainage management works to perimeter of compartment. No issues noted.

Table 3: Turbine 1 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
15 j	1995	SS/LP	12

Figure 1: Turbine 1 location view to north



Figure 2: Turbine 1 location view to east



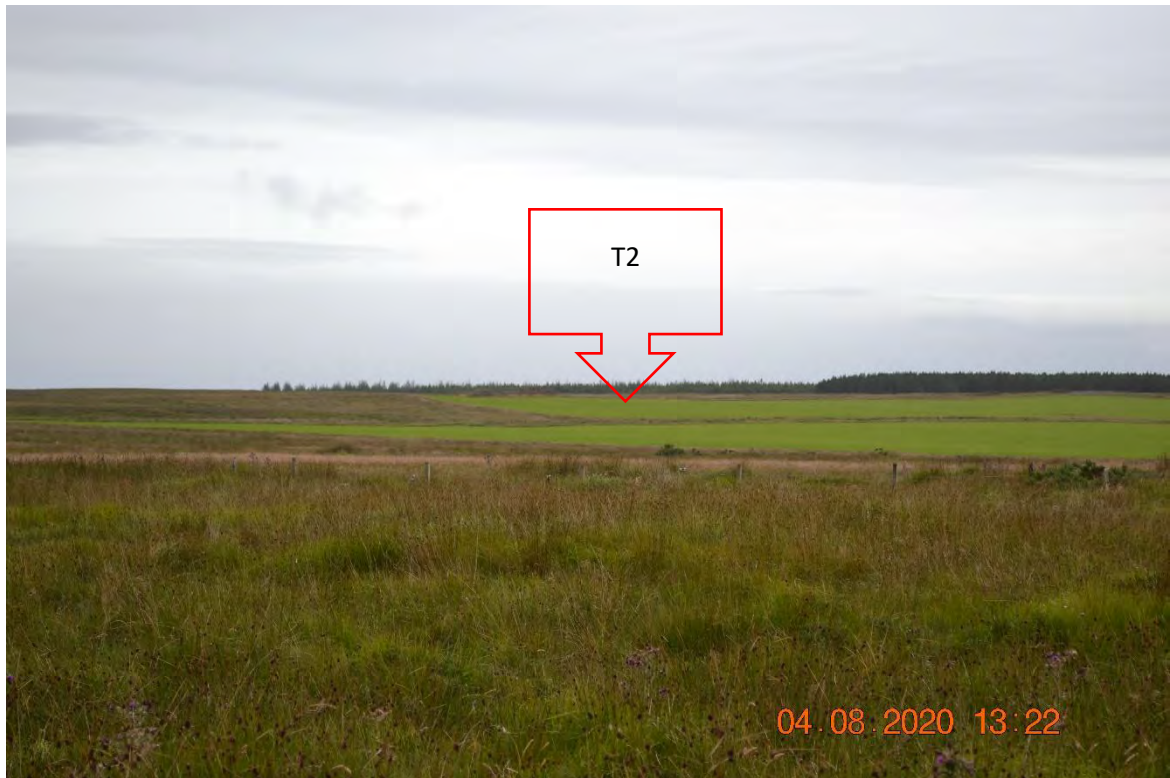
Figure 3: Turbine 1 location view to west



Turbine 2

Field has been cropped for grass.

Figure 4: View to Turbine 2 from forest edge nearest T8 looking due south



Turbine 3

Open ground in between edges of forest

Figure 5: Turbine 3 location view south



Figure 6: Turbine 3 location view north*Turbine 4*

No issues noted

Table 4: Turbine 4 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
17 g	1995	SS/LP	12

Figure 7: Turbine 4 location view north



Figure 8: Turbine 4 location view south



Figure 9: Turbine 4 location view north*Turbine 6*

No issues noted.

Table 5: Turbine 6 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
19 u	1995	SS/LP	10

Figure 10: Turbine 6 location view south



Figure 11: Turbine 6 location view north



Turbine 7
No issues noted.

Table 6: Turbine 7 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
21 h	1995	SS/LP	10

Figure 12: Turbine 7 location view north

Figure 13: Turbine 7 location view south*Turbine 8*

No issues noted.

Table 7: Turbine 8 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
20 j	1995	SS/LP	12

Figure 14: Turbine 8 location view north



Figure 15: Turbine 8 location view south



Turbine 9
No issues noted.

Table 8: Turbine 9 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
22 r	1994	SS/LP	12

Figure 16: Turbine 9 location view east

Figure 17: Turbine 9 location view west



Turbine 10
Open ground.

Figure 18: View to Turbine 10 from forest edge looking due east



Figure 19: Turbine 10 location view north



Figure 20: Turbine 10 location view south



Turbine 11

Edge of compartment has suffered from check, so yield for the area to be occupied by the turbine may be lower than average for the subcompartment.

Table 9: Turbine 11 subcompartment information

Subcompartment	Planting Year	Species	Yield Class
9 k	1995	SS/LP	10

Figure 21: Turbine 11 location view south



Figure 22: Turbine 11 location view north*Solar Location A*

The majority of the land cover within the Solar plot is predominantly remnants of native broadleaved planting interspersed with larger clumps of SS as shown in the following photograph. The area is located within both compartments 3 and 5.

Table 10: Solar location A subcompartment information

Subcompartment	Planting Year	Species	Yield Class
3	1994	NBL	NBL/OG
5	1994	NBL/OG	NBL/OG

Figure 23: Solar location A



Solar Location B

As shown in the photograph below, Solar location B is proposed for an area of grass land that has recently been cropped for hay or silage.

Figure 24: Solar location B



Solar location 'C'

The area currently proposed for solar location C lies in compartment 24. The larger proportion of the area has recently been restocked post clear fell with SS, LP and NBL and has been planted in 2020. The smaller portion of the proposed area has a standing crop of P81 SS with a YC14.

Table 11: Solar location C subcompartment information

Subcompartment	Planting Year	Species	Yield Class
24	2020	SS LP NBL	N/A

The following photograph shows the area of clear fell looking towards (south west direction) the remaining standing timber.

There was evidence of windblow beginning to encroach into the standing timber from this now exposed edge of trees.

Figure 25: Clear-fell within compartment 24



Solar location D

This proposed area lies outside the forest boundary as per the Forest Survey map but can be seen from the edge of the restocked area described in the previous solar location 'C'.

Figure 26: Solar location D located beyond boundary of compartment 29



Solar Location E

This location is around Turbine 3 and 11, further felling around these 2 points would create area E. Detailed information regarding this information is captured under Turbine 3 and Turbine 11 above.

Solar Location F

This location is around Turbine 7, 8 and 9, further felling around these 3 points would create area F. Detailed information regarding this information is captured under Turbine 7, Turbine 8 and Turbine 9 above.

Solar Location G

This location is around Turbine 1 and 4, further felling around these 2 points would create area F. Detailed information regarding this information is captured under Turbine 1 and Turbine 4 above.

Additional Observations

Windblow

One small area of existing windblow was found on the western edge of compartment 23e. This is occurring in a crop of P81 LP, YC8. The windblow is currently contained to an area approximately less than 0.1 ha, however the crop appears to be stressed and further losses would be expected.

The location is part way between Turbine 7 and 9 as shown on **Figure 28** below.

Figure 27: location of localised windblow

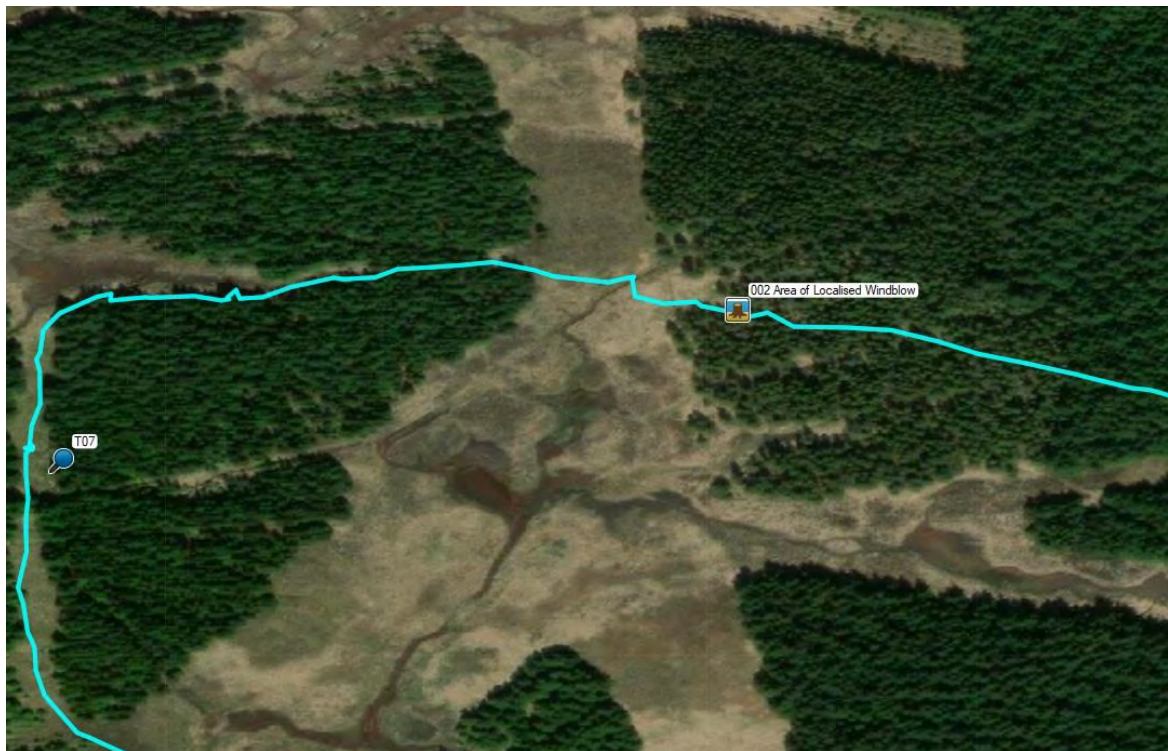


Figure 28: Localised area of windblow



The other area that is likely to be prone to windblow is in compartment 24b as highlighted under Solar Location C above. Any further felling within 24 b & m will need to be felled back to a windfirm edge or more likely the edge of the compartment/sub-compartment boundary.

The wind risk for the whole study area is expected to be low. Forest Gales software predicts a Risk score of 1 as shown in **Appendix 2**.

The original planting of the whole study area has been undertaken to provide a matrix of closely grouped sub compartments that now have open ground in between the sub compartments and thus windfirm edges around the individual plantings with no sub compartment greater than 12.25 ha. This has resulted in greater windfirm stability for whole the study area rather than planting less compartments of a greater individual size.

4. Renewable Energy Development Forest Plan

The effect of the proposed Development on the structure of the woodlands within the study area has been compared against the existing Forestry Plan.

4.1 Felling

Within forests and woodlands, areas of crop may require to be felled to accommodate the construction and operation of the proposed Development.

In relation to forestry, the key objective of the proposed Development has been to minimise the amount of tree felling and ensure that all felling for the wind turbines would be based on keyhole felling.

The specific areas where felling is required are detailed below.

Wind Turbine Buffers

A circular buffer area with a radius of around 100 m would be felled for each wind turbine; this is the minimum area required for both ecological and turbine efficiency reasons. The circular buffers in relation to Turbines 1, 3, 4 and 8 will be extended slightly where necessary to avoid partial felling of small sub-compartments which would have increased the risk of windblow in relation to the retained trees. The objective has also been to retain the current windfarm edges of sub-compartments wherever possible and we have also taken into account the prevailing south westerly winds.

Solar Array

The solar array development area has been carefully chosen to minimise the amount of felling required. **Figure 15.1** of the EIA Report shows that the area chosen is comprised of scattered small sub-compartments within a considerable area of open space. This development would therefore not only involve a relatively small amount of felling to achieve an area that is large enough to support a viable solar array, but it also involves no felling that would increase the windthrow risk to the retained plantations.

Access Tracks

Existing access tracks have been utilised wherever possible. Where it has not been possible to use existing tracks, the shortest possible route has been chosen subject to avoiding watercourses or other environmentally sensitive areas. The width of the access routes has been kept to the minimum (tracks would have a 5 m running width) required for the transportation of the construction materials. A 12.5 m felling buffer has been applied to the proposed access tracks to ensure there is enough space for deliveries and plant machinery to manoeuvre, this includes passing places and wider tracks on bends as required. This would create an overall access track corridor of 25 m.

Other Areas to be Felled

There would be a relatively small amount of felling to provide clear areas for the ancillary infrastructure. A 10 m buffer has also been applied to ancillary infrastructure.

4.2 Renewable Energy Development Felling Plan

Proposed Development

Figure 15.4 of the EIA Report shows the felling plan for the proposed Development. The total felling area would be 24.3 ha.

The total timber volume has also been calculated using the Yield Class tables in the sub compartment schedule provided by RDS Forestry. It has been assumed that all plantations are fully stocked, so the total volume is the absolute maximum that will be felled. Native Broadleaves plantation has not been included in the timber volume assessment as the native broadleaves observed during the field survey were of insufficient size.

The total timber volume to be felled is estimated to be 3,496m³. Using a conversion factor of 1.08 m³ to a tonne, this equates to 3,776 tonnes.

Table 12 disaggregates the felling and timber volumes by sub-compartment, species, planting year and yield class.

Table 12: Proposed Development timber volume assessment

Compartment	Sub-compartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
1	f	0.02	SS	1984	37	10	185	2.87
1	h	0.00005	SS/LP	1984	37	14	266	0.01
1	i	0.33	SS/LP	1984	37	14	266	88.26
3	u	0.01	SS	2002	37	14	312	3.32
3	u	0.0002	SS	2002	19	14	101	0.02
3	u	0.003	SS	1984	19	16	101	0.35
3	w	0.06	SS	1984	37	16	312	18.73
3	x	0.13	SS	1984	37	16	312	39.82
5	l	0.03	SS	2002	19	14	39	1.11
5	l	0.04	SS	2002	19	14	39	1.53
5	l	0.02	SS	2002	19	14	39	0.65
5	l	0.02	SS	2002	19	14	39	0.60
5	l	0.03	SS	2002	19	14	39	1.36

Compartment	Sub-compartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
5	1	0.03	SS	2002	19	14	39	1.23
5	1	0.04	SS	2002	19	14	39	1.61
5	1	0.08	SS	2002	19	14	39	3.3
5	1	0.03	SS	2002	19	14	39	1.33
5	1	0.01	SS	2002	19	14	39	0.5
5	1	0.01	SS	2002	19	14	39	0.42
5	1	0.05	SS	2002	19	14	39	1.8
5	1	0.02	SS	2002	19	14	39	0.79
5	1	0.04	SS	2002	19	14	39	1.39
5	1	0.02	SS	2002	19	14	39	0.63
5	1	0.07	SS	2002	19	14	39	2.35
5	1	0.02	SS	2002	19	14	39	0.91
5	1	0.03	SS	2002	19	14	39	1.05
5	1	0.02	SS	2002	19	14	39	0.66
5	1	0.03	SS	2002	19	14	39	1.15

Compartment	Sub-compartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
5	l	0.01	SS	2002	19	14	39	0.22
5	l	0.04	SS	2002	19	14	39	1.53
9	k	1.59	SS/LP	1995	26	10	152	241.6
9	l	1.5	SS/LP	1995	26	10	152	228.01
11	f	0.0006	SS/LP	1995	26	8	72	0.05
11	k	0.05	SS/LP	1995	26	8	72	3.87
11	o	0.74	SS/LP	1984	37	14	266	196.9
11	p	0.98	SS/LP	1984	37	16	312	306.26
12	f	0.12	SS	1984	37	16	312	38.35
12	m	0.11	SS/LP	1994	27	12	133	15.2
13	c	0.06	SS/LP	1995	26	14	158	10.14
13	d	0.05	SS/LP	1995	26	12	133	7.13
13	e	0.36	SS/LP	1995	26	12	133	48.45
13	g	0.17	SS/LP	1995	26	14	158	26.32
13	h	0.34	SS/LP	1995	26	14	158	54.48

Compartment	Sub-compartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
13	i	0.07	SS/LP	1995	26	14	158	11.68
13	j	0.25	SS/LP	1995	26	14	158	39.85
15	d	0.14	SS/LP	1995	26	12	133	18.1
15	e	0.48	SS/LP	1995	26	12	133	63.81
15	g	0.16	SS/LP	1995	26	12	133	21.67
15	j	2.1	SS/LP	1995	26	12	133	278.9
16	e	0.0009	SS/LP	1995	26	12	133	0.12
16	f	0.02	SS/LP	1995	26	12	133	2.04
16	h	0.04	SS/LP	1995	26	12	133	5.37
16	j	0.65	SS/LP	1995	26	12	133	85.98
17	c	0.04	SS/LP	1995	26	12	133	5.23
17	e	0.49	SS/LP	1995	26	12	133	65.27
17	f	0.003	SS/LP	1995	26	12	133	0.45
17	g	1.45	SS/LP	1995	26	12	133	192.8
17	i	0.3	SS/LP	1995	26	12	133	39.75

Compartment	Sub-compartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
17	j	0.16	SS/LP	1995	26	12	133	21.36
17	k	0.12	SS/LP	1995	26	12	133	15.85
19	e	0.04	SS	2002	19	14	103	4.77
19	e	0.03	SS	2002	19	14	103	3.15
19	e	0.05	SS	2002	19	14	103	5.16
19	e	0.04	SS	2002	19	14	103	4.26
19	e	0.03	SS	2002	19	14	103	3.57
19	l	0.04	SS	2002	19	14	103	4
19	p	0.0002	SS/LP	1995	26	10	105	0.02
19	s	0.74	SS/LP	1995	26	10	105	77.76
19	u	0.26	SS/LP	1995	26	10	105	26.9
19	v	0.07	SS/LP	1995	26	10	105	6.99
20	d	0.15	SS/LP	1995	26	12	133	19.5
20	h	0.49	SS/LP	1995	26	10	105	51.5
20	j	2.45	SS/LP	1995	26	12	133	325.65

Compartment	Sub-compartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
21	c	0.23	SS/LP	1995	26	10	105	23.69
21	d	0.004	SS/LP	1995	26	10	105	0.44
21	g	0.22	SS/LP	1995	26	10	105	23.15
21	h	0.86	SS/LP	1995	26	10	105	90.08
21	i	1.26	SS/LP	1995	26	10	105	132.53
21	m	0.36	SS/LP WDG	1995	26	8	72	26.18
22	l	0.61	SS/LP	1994	27	12	133	80.64
22	p	0.06	SS/LP	1994	27	12	133	7.73
22	q	0.27	SS/LP	1994	27	12	133	36.51
22	r	1.72	SS/LP	1994	27	12	133	228.67
23	e	0.18	LP	1981	40	8	182	33.40
23	p	0.08	SS/LP	1981	40	12	276	21.2
23	q	0.25	SS/LP	1994	27	12	133	33.7
	Total Area (ha)	24.28					Total Timber Volume (m³)	3495.69

Habitat Management Plan (HMP)

The Applicant have identified opportunities to restore some areas of the Site which have been affected by historical land use (e.g. forestry and land drainage). An area of 168 ha surrounding the Philip Mains SSSI has been identified for habitat management with the aim of restoring the area to bog habitat. This would require an additional 88.4 ha of felling.

Table 13 below shows the total felling and timber volumes associated with the HMP area.

Table 13: HMP timber volume assessment

Compartment	Subcompartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
22	g	1.24	OL	1994	27	12	168	208.90
22	h	1.2	LP	1994	27	12	168	200.95
22	r	0.01	SS	1994	27	12	168	1.87
23	a	0.48	SS	1981	40	8	214	103.12
23	b	0.68	LP	1981	40	8	214	146.03
23	c	0.9	OL	1981	40	8	214	192.04
23	d	1.52	LP	1981	40	8	214	325.26
23	e	1.77	SS	1981	40	8	214	377.97
23	k	0.07	OL	1981	40	12	287	21.42
23	l	0.38	LP	1981	40	12	287	109.71
23	m	1.37	LP	1981	40	12	287	391.78
23	n	1.94	OL	1994	27	12	168	325.95
23	o	2.03	OL	1994	27	12	168	340.78

Compartment	Subcompartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
23	p	2.85	SS	1981	40	12	287	818.98
23	q	4.61	SS	1994	27	12	168	774.08
23	r	5.05	LP	1994	27	12	168	847.81
24	a	0.84	NBL	1981	40	8	214	180.43
24	b	7.38	SS	1981	40	10	257	1897.33
24	c	0.87	OL	1981	40	8	214	186.08
24	d	0.57	OL	1981	40	10	257	146.51
24	m	2.3	SS	1981	40	14	323	743.17
25	a	2.87	OL	1981	40	10	257	738.44
25	b	1.4	NBL	1981	40	10	257	358.71
25	c	4.88	OL	1981	40	10	257	1253.38
25	d	0.001	OL	1981	40	10	257	0.19
25	e	3.49	NBL	1981	40	10	257	897.83
25	f	0.26	OL	1981	40	10	257	67.021
25	g	0.72	OL	1981	40	10	257	185.54

Compartment	Subcompartment	Area (ha)	Species	Planting Year	Age	Yield Class	m ³ /ha	m ³ total
27	a	1.54	SS	1981	40	10	257	397
27	b	3.38	OL	1981	40	10	257	868.98
27	c	7.45	NBL	1981	40	10	257	1915.01
28	a	9.01	SS	1981	40	10	257	2316.64
28	b	11.81	SS	1981	40	10	257	3036.02
28	d	4.78	SS	1981	40	14	323	1543.89
	Total Area (ha)	88.43					Total Timber Volume (m³)	21709.93

Renewable Energy Development Felling Plan

The proposed Renewable Energy Development Felling Plan is shown in **Table 14** below. The area of felling during Phase 1 of the Renewable Energy Development Felling Plan includes the felling associated with the proposed Development and the additional areas of Phase 1 felling from the baseline felling plan that would be unaffected by the proposed Development. The Phase 1 felling has been disaggregated in Table 14 for clarity. Whatever advanced felling has been conducted as part of the proposed Development has been subtracted from the relevant subsequent felling phases.

Table 14: Renewable Energy Development Felling Plan

Fell Phase	Area (ha)	Area (%)
Phase 1 - Site Infrastructure	24.3	3.2
Phase 1 - HMP Area	88.4	11.8
Phase 1 – Planned Felling	47	17.5
Phase 2: 2022-2027	28.6	14.6
Phase 3: 2028-2032	131.3	1
Phase 4: 2033-2037	110.1	1.1
Conifer Long-term Rotation	7.3	1
Natural Reserve	8.1	13.5
Open Ground	7.8	26.1
Other Land	101.3	3.8
Woodland Grazing	196.2	17.5
Totals	751.7	100%

Table 15 below compares the baseline and Renewable Energy Development felling plans.

Table 15: Felling plan comparison

Fell Phase	Baseline Felling Plan	Renewable Energy Development Felling Plan	Variance	
	Area (ha)	Area (ha)	Area (ha)	Area (%)
Phase 1: 2018-2022	49	158.7	109.7	14.6
Phase 2: 2022-2027	58.8	27.9	-29.5	-3.9
Phase 3: 2028-2032	176.5	130.6	-44.5	-5.9
Phase 4: 2033-2037	146.6	109.4	-35.8	-4.7
Conifer Long-term Rotation	7.3	7.3	N/A	N/A
Natural Reserve	8	8	N/A	N/A
Open Ground	7.8	7.8	N/A	N/A
Other Land	101.3	101.3	N/A	N/A
Woodland Grazing	196.2	196.2	N/A	N/A
Total	751.7	751.7	0	0

4.3 Renewable Energy Development Restocking Plan

There would be no restocking of felled areas as the keyholes and setback distances adopted for construction would be required for ongoing operation and maintenance or environmental reasons. Therefore, no Renewable Energy Development Restocking Plan is proposed.

The species composition of the forest within the study area would change as a result of the proposed Development forestry proposals. In particular, the area of conifer woodland would decrease by 49.1ha and the area of broadleaf woodland would decrease by 12.23ha (including native woodland). The area of unplanted ground would increase and as a result, there would be a net loss of woodland area of 61.23ha.

5. Requirement for Compensatory Planting

As construction of the proposed Development would involve the permanent removal of woodland for the purposes of conversion to another type of land use, the CWR has been fully considered to establish whether SF would require an area of new woodland establishment to compensate for the area felled.

The SF guidance to staff on implementing the CWR states that:

“Options to avoid or reduce the need for Compensation Planting should always be fully considered as part of the decision making process. Compensation Planting should be seen as the final option once all other solutions have been exhausted”.

The guidance also states the following in relation to windfarm developments:

“With regards to windfarm development, trees cleared for turbines bases, access roads and any other windfarm related infrastructure (infrastructure felling) should be considered as part of a planning application (under the Electricity Act 1989 or the Town and Country Planning Act 1997) and the felling should be consented with Compensation Planting requirements”.

A fundamental policy that has been followed throughout in relation to the design of the proposed Development and associated infrastructure has been to minimise the amount of permanent felling. This would ensure compliance with the CWR.

It is not considered that the project would qualify for change of land use without compensatory planting, as it could not contribute significantly to any of the relevant criteria detailed in Appendix C of CWR. However, the proposed Development would meet the acceptability criteria for woodland removal as the change of land use with compensatory planting would contribute significantly to “helping Scotland to adapt to climate change” by providing facilities appropriate for the development of renewable energy projects and significantly reduce net greenhouse gas emissions.

Typically, the maximum area of land that would need to be planted (the SF default position) is an area equivalent to the area being felled and left unplanted, which in this case is estimated to be 24.3 ha. However, as shown on **Figure 15.3** of the EIA Report, the HMP area overlaps an area of the forestry felling buffer along the access track between Turbines 7 and 10. In accordance with advice from Scottish Forestry, which is detailed further in **Chapter 15: Other Issues** of the EIA Report, the proposed restoration of bog habitat should not require compensatory planting for the forestry felled. As the HMP felling area is exempt from compensatory planting, the area of overlap has been discounted from the total felling area associated with the RED. The total area of compensatory planting is 24.3 ha.

Once the area for compensatory planting has been decided, a full specification would be drawn up to include ground preparation, drainage, planting technique, stocking density, species, maintenance and protection. Discussions would be held with Scottish Forestry (SF) to ensure that all the final plans meet with their approval and the existing Long Term Forest Plans will be amended and sent to SF for approval. The approved plans will then effectively incorporate a felling licence for all the planned felling.

6. Forestry Waste

THC in their pre-application response stated they:

“will require reassurance that any felled trees will be removed from site and not left as waste”.

The response is detailed further in **Chapter 15: Other Issues** of the EIA Report.

The Scottish Environment Protection Agency (SEPA) guidance document WST-G-027, 'Management of Forestry Waste' (SEPA, 2013) highlights that all waste producers have a statutory duty to adopt the waste hierarchy as per the Waste (Scotland) Regulations 2012 (the Scottish Government, 2012)", which amended Section 34 of the Environmental Protection Act (EPA) 1990 (duty of care) (UK Government, 1990). This places a specific duty on any person who produces, keeps or manages (controlled) waste to take all such measures available to them to apply the waste hierarchy in Article 4 (1) of the revised Waste Framework Directives WFD), which is:

- prevention;
- preparing for re-use;
- recycling;
- other recovery, including energy recovery; and
- disposal, in a way which delivers the best overall environmental outcome.

Further guidance is provided in SEPA's LUPS-GU27 - Use of Trees Cleared to Facilitate Development on Afforested Land, which states that the best practice for dealing with forest materials at development sites is as follows:

"a) Professional forester input to quantify the likely volume, markets and economic uses of trees to be exported from the Site

b) Developer commitment to employ a professional forester (preferably the same one used to provide advice on the ES submission) to implement and maximise the removal of timber and forest residue on Site.

c) Quantify the likely volumes of material for which no economic off-site use can be found

d) Identify if there are valid uses on site for material for which no economic off-site use can be found"

The method of felling and utilisation at the Site would be based on short wood felling system and all the timber would be removed from the Site. A conventional harvester and forwarder would be used to fell and extract the timber from all felled areas.

The round timber is likely to be sent to Balcas, Invergordon for wood pellet and electricity production. In the past about 5% of the timber has been sold to local firewood merchants in Caithness.

All the branchwood (all the branches with a diameter less than 7 cm cut off the main stem when producing the timber plus the top off the tree) would be left in situ.

It is appreciated that buffer areas are required to protect water courses in order to maintain well oxygenated water that is low in sediment content and free from contaminants.

In accordance with The UK Forestry Standard - Table 6.7.2, the minimum buffer widths from the forest edge to the watercourses will be as set out in **Table 16**.

Table 16: UKFS watercourse buffers

Buffer width	Situation
10 m	Along permanent watercourses with a channel less than 2 m wide (narrower widths of buffer area may be allowable along minor watercourses with a channel less than 1 m wide, especially on steep ground)
20 m	Along watercourses with a channel more than 2 m wide and along the edge of lakes, reservoirs, large ponds and wetland
50 m	Around abstraction points for public or private water supply, such as springs, wells, boreholes and surface water intakes

As far as the proposed Development is concerned, branchwood will be scraped back where relevant so that these buffer areas will be kept clear of all timber and brash from the planned felling.

It is proposed that full consideration and further clarification on this issue would be included in a Forestry Waste Management Plan to form part of the Construction Environmental Management Plan (CEMP) during the detailed planning phase following receipt of planning consent and prior to commencement of construction.

7. Forestry Management Practices

7.1 Harvesting Method

Areas of crops of sufficient tree size and standing volume would be harvested conventionally. Timber operations would be undertaken with conventional harvesting and forwarding equipment utilising flotation tracks as required. The flotation devices are fitted to each machine wheel which gives the machines very low ground pressure and minimises the ground disturbance during the forestry operations.

On wetter ground the harvester would build stronger brash mats to ensure there would be minimal damage to the peat and soil structure by the forwarder during extraction. On soft ground, the bottom layers of brash mats become embedded into the soil and removal could result in more environmental damage than leaving the material to naturally degrade.

In areas of young or lower yield class crops, where little or no merchantable timber would be recovered, a number of options could be utilised depending on the factors prevailing at the time of clearance. The methodology used would depend on tree size; site conditions; the availability of suitable equipment; and the markets prevailing at the time of the works being carried out. Where there was suitable access and ground conditions the trees could be whole tree harvested and extracted to roadside for chipping as biomass.

Where trees are very small due to age or poor growth it may be more viable to fell the crop manually using scrub cutters or chainsaws. The end use of the material would depend on the factors mentioned above, but in some cases there would be no recoverable material. Where material was recoverable it could potentially be used on site in the base of floating roads; extracted and processed for biomass; or used for ecological enhancement if applicable.

Stumps would be left in situ as per the guidance contained in the Forestry Commission Research Note "Environmental effects of stump and root harvesting" (Forestry Commission, 2011)⁷ except where they would be removed for borrow pits, excavated roads, turbine bases and other infrastructure requiring excavation. Such material would be treated as described above.

Appendix 3 include images depicting the proposed harvesting method.

7.2 Aftercare Works

Aftercare establishment works would normally include, but are not limited to, the following:

- the woodlands would be beaten up (replacement of failures) to ensure satisfactory stocking levels by year 5, broadleaf woodlands by year 10;
- the woodlands would be weeded as necessary to ensure satisfactory establishment by year 5/year 10 for broadleaf woodlands;
- the woodlands would be protected against pine weevils by management inspections and remedial treatment as necessary;
- the woodlands would be protected against browsing damage from wild and domestic animals;
- the woodlands would be protected against fire;
- fertiliser would be applied as necessary to ensure satisfactory establishment and growth; and
- other works as reasonably required ensuring satisfactory establishment of the woodlands.

7.3 Standards and Guidelines

All forestry operations would be carried out in strict accordance with current good practice and guidelines. This would include, but not be limited to:

- UK Forestry Standard (Forestry Commission 2017);
- Forest Industry Safety Accord Guides (or equivalent) (FISA, 2014); and
- current relevant legislation including, but not limited to, Health and Safety at Work Act 1974 (UK Government, 2014)

8. Summary

The study area is comprised of privately owned and managed commercial forestry plantations.

The impact of the proposed turbine and solar locations on the forest should have minimal issues outwith any premature felling of crops. Felling would be advanced on 82.23 ha for construction of the proposed Development. The species composition of the forest would change as a result of the proposed Development forestry proposals. In particular, the area of conifer woodland would decrease by 49.1ha and the area of broadleaf woodland would decrease by 12.23ha (including native woodland). The area of unplanted ground would increase and as a result, there would be a net loss of woodland area of 61.23ha.

In order to comply with the Scottish Government's Control of Woodland Removal Policy, compensation planting would be required to mitigate for the loss of woodland area. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting to be agreed with SF, taking into account any revision to the felling and restocking plans prior to the commencement of operation.

9. References

Forest Yield: A handbook for forest growth and yield tables for British forestry: Forestry Commission: 2016

Forestry and Land Management (Scotland) Act (2018)

Health and Safety at Work etc Act 1974

Highland Forest and Woodland Strategy: The Highland Council: 2018

Land Use Planning System SEPA Guidance Note LUPS-GU27 – Use of trees Cleared to Facilitate Development on Afforested Land: Scottish Environment Protection Agency: 2014

Management of Forestry Waste: SEPA: 2013

Scottish Forestry Strategy 2019-2029: Scottish Government: 2019

Scottish Government’s policy on control of woodland removal: implementation guidance: Forestry Commission Scotland: 2019 Available at: [https://www.forestry.gov.uk/PDF/fcfc125.pdf/\\$FILE/fcfc125.pdf](https://www.forestry.gov.uk/PDF/fcfc125.pdf/$FILE/fcfc125.pdf) [Accessed in November 2020]

Technical Paper 16: Designing Forest Edges to Improve Wind Stability: Forestry Commission: 1996

The Land Use Strategy for Scotland 2016-2021: Scottish Government: 2016

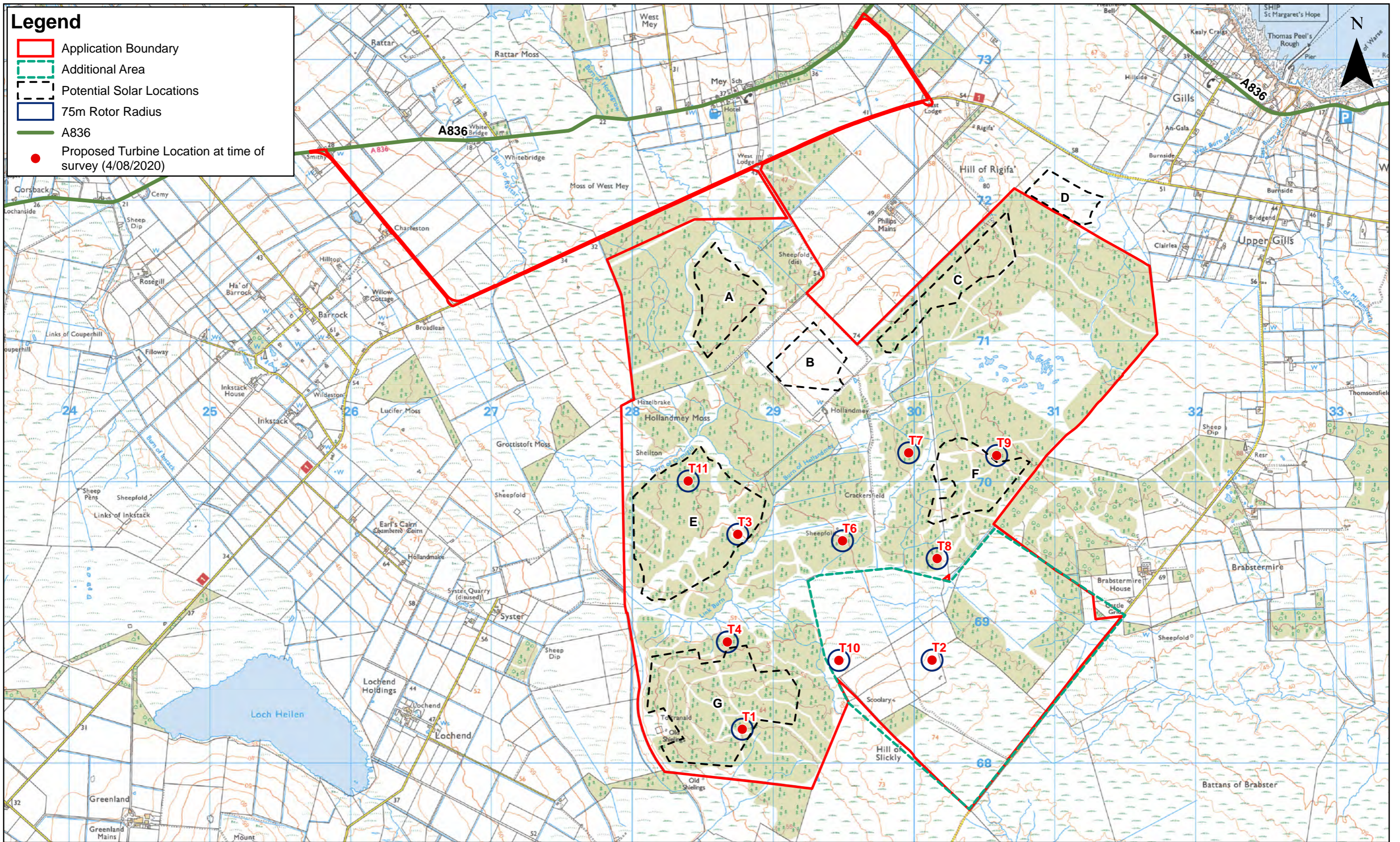
The Scottish Government’s Policy on Control of Woodland Removal: Forestry Commission Scotland: 2009

The UK Forestry Standard (Fourth edition): Forestry Commission: 2017

Trees, Woodlands and Development supplementary guidance: The Highland Council: 2013

UKWAS (Fourth Edition): UKWAS: 2018.

Appendix 1: Site Layout and Survey Locations for Site Visit



Rev	Date	By	Comment
B	11/11/2021	DL	Application boundary updated.
A	31/07/2020	AJ	First Issue.

1:25,000
Scale @ A3

© Crown Copyright 2021. All rights reserved.
Ordnance Survey Licence 0100031673.

Hollandmey Renewable Energy Development
Figure 15.1.1: Forestry Survey Site Layout

Drg No	HMY_C_045	
Rev	B	Datum: OSGB36
Date	11/11/2021	Projection: TM
Figure	15.1.1	

Figure 2.2: Survey Locations



Appendix 2: Forest Gales Results Table

ForestGALES Results		
Stand Characteristics		
Soil Group:	D: Deep Peats	
Rooting:	1. Shallow Rooting (<80 cm)	
Top Height:	18 m	
Tree Characteristics		
Yield Class:	12	
Thinning Regime:	No Thin	
Initial Spacing:	1.8 m	
Age:	40 years	
Detailed Aspect Method of Scoring (DAMS)		
DAMS Score:	15	
Wind Damage Risk		
Risk	Status	Critical Wind Speed
Overturning	1	41.4 m/s
Breakage	1	36.3 m/s

Appendix 3: Harvesting Method

Figure 3.1: Standard excavator harvester



Figure 3.2: Lodgepole Pine excavator with wood shears



Figure 3.3: Conventional fell to harvest



Figure 3.4: Hi recovery system with approximately 50 metres between racks



Figure 3.5: Hi recovery system allows flexibility regarding route to enable protection of sensitive receptors such as riparian zones as shown on left of figure

