VEON Forestry, Ecology & Environment

Forestry Report

Kellystown Wind Farm

Co. Louth

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Definition of Terms

- **Afforestation**
  The establishment of a forest in areas where the preceding vegetation or land use was not forest.

- **Buffer Zones (or exclusion/setback areas)**
  A buffer zone or exclusion area is a specific area where harvesting machines are not permitted to travel through, and which is managed for environmental protection and enhancement. Setback areas are used at the afforestation or replanting stages to introduce a buffer strip between a new forest and sensitive habitats or features.

- **Clear-felling**
  The final stage in a typical commercial forestry crop cycle, where an entire standing crop of trees is removed from an area (also known as clear-cutting or clearcut logging).

- **Coupe**
  A small area of forest within a compartment that is harvested in a single operation.

- **Endemic windblow**
  The uprooting of trees in forests during typical winter storm events.

- **Eutrophication**
  A process where a high concentration of nutrients has been introduced into a watercourse which promotes an excessive growth of algae which can deplete oxygen levels in the water and deleteriously affect aquatic life.

- **Hectare**
  A unit of land area equal to 10,000 square metres, or 2.4711 acres.

- **Mound Drains**
  Formed by an excavator digging drains at regular intervals and heaping the excavated soil in mounds. Trees are then planted into the mounds which provide an elevated vegetation-free zone.

- **Plantation**
  A forest or tree crop established by the manual planting of saplings or seedlings.

- **Relevant watercourse**
  Any other watercourse that has the potential to act as a pathway for the movement of significant amounts of sediment and/or nutrients from the site to an aquatic zone. These include existing drains/channels and other potential pathways that may contain flowing water during and immediately after periods of rain.

- **Rotation**
  The period of years required to establish and grow a timber crop to a specified condition of maturity, when it may be harvested, and a new tree crop started.

- **Sawlog**
  The most profitable wood product that is widely used for construction. Sawlogs are 3.7 metres or greater in length and have a minimum diameter of 20 cm.

- **Snedding (or delimbing)**
  The removal of side branches from a felled tree to leave a smooth log.

- **Stand**
  An aggregation of trees occupying a specific area and uniform enough in composition (species), age and arrangement to be distinguishable from the forest on adjoining areas and considered a homogenous unit for management purposes.

- **Top height**
  The average height of the 100 trees with the largest diameter at breast height (DBH) at the time of measurement.

- **Windblow**
  The uprooting of trees by wind.

- **Wind snap**
  The breakage of tree trunks (or boles) above ground by wind force.

- **Yield Class (YC)**
  This is defined as the potential growth rate or yield of a forest, expressed as cubic meter per hectare per year.

1. Project background

This report has been prepared to assess the impact of this proposed onshore wind farm development upon existing forestry within the project red line boundary area. The proposed development site comprises circa 165 hectares and the installation of five wind turbines with a tip height of up to 180 metres is planned. Access tracks, a substation, a permanent meteorological mast, a temporary construction compound, a battery storage facility, underground cabling and a grid connection to the national electricity grid are also due for construction. It is predicted the project will generate sufficient low-carbon electricity to power the equivalent of c. 22,000 homes across Ireland.

This report will outline the existing forest environment within the development area and the impact of the proposed project construction on the same. An overview of forest harvesting operations that would occur on the site is also presented, including the relevant environmental considerations and necessary mitigation measures and the legal/replanting obligations associated with the felling proposed to occur.

1.1 Site Description

The proposed development area is situated in County Louth, c. 3.5 km south of the town of Dunleer and c. 5.5 km from the east coast. Given the scale of the project, the development area incorporates numerous townlands: Stonehouse, Kearneystown, Gallstown, Rokeby, Swinestown, Drumshallon and Piperstown. The main approaching roads are the M1, the N33 and the N51 and the geographic location of the site presents reasonable access to the harvesting network of timber buyers nationwide.

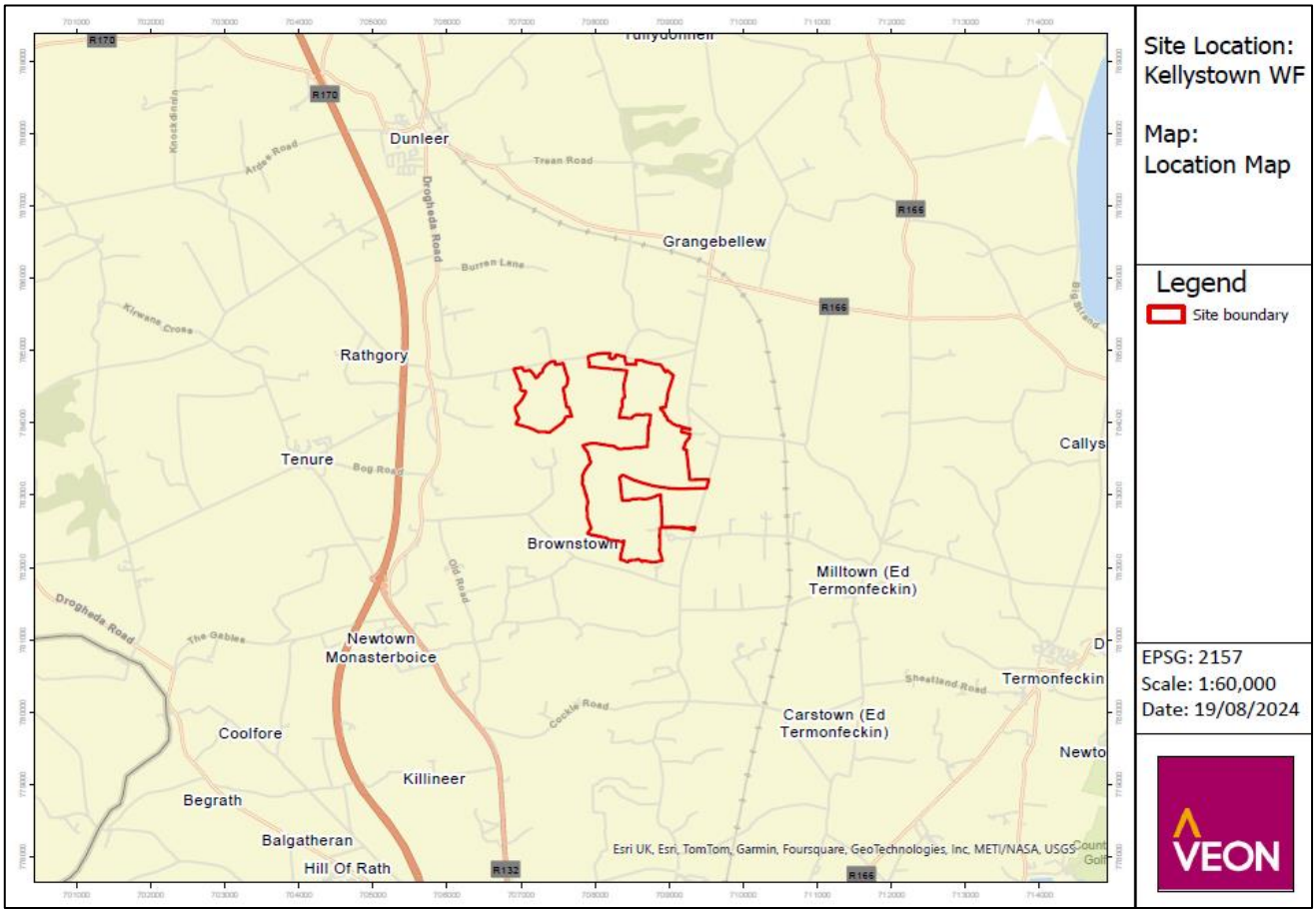


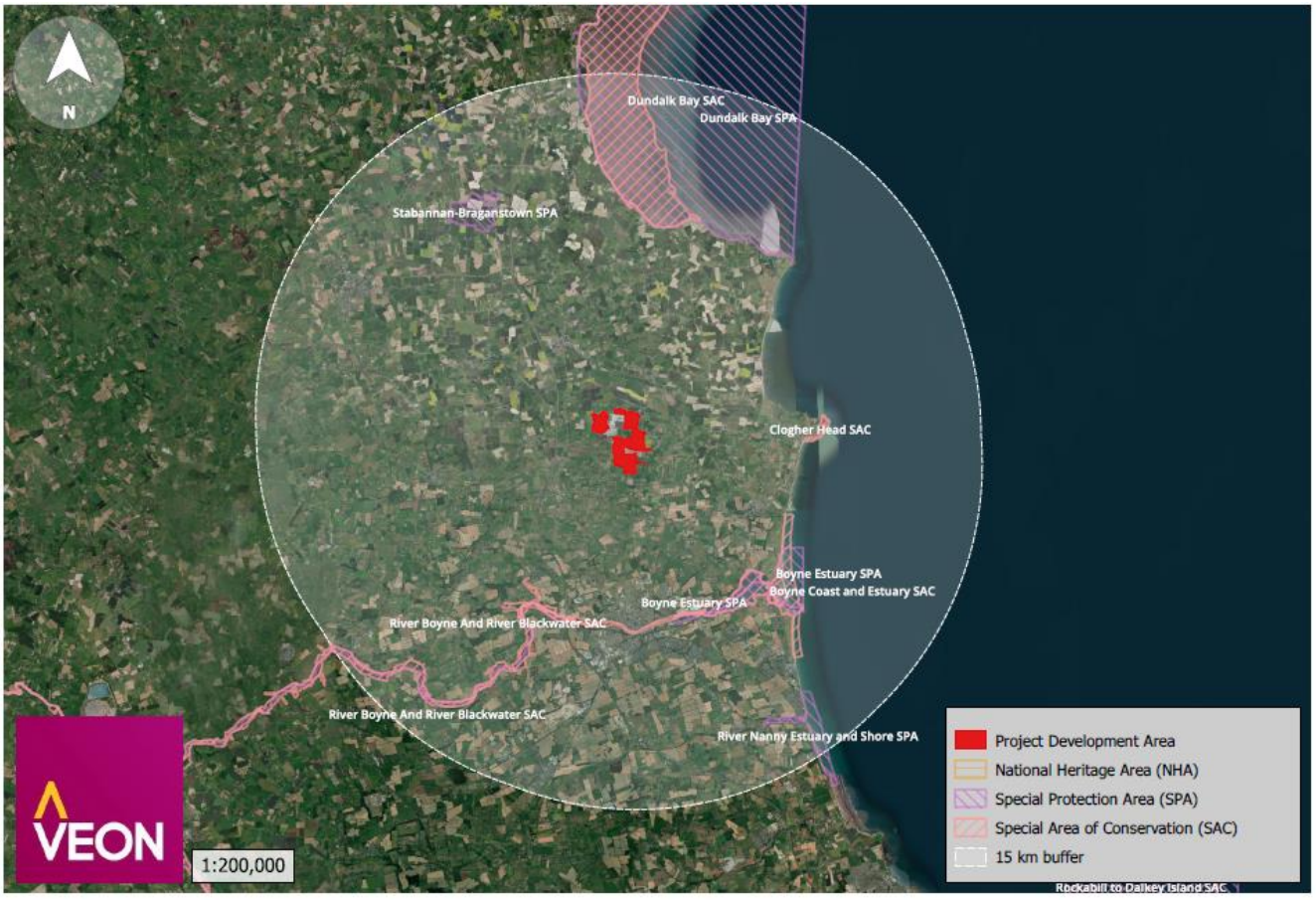
Figure 1.1: Location of the proposed wind farm development.

The proposed wind farm is due to be constructed on an area of elevated ground known as 'Carnanbreaga': an east-to-west orientated outcrop ridge. The forestry on site is predominantly underlain by a mixture of well-drained and poorly drained mineral soils derived from non-calcareous parent materials (i.e. surface and groundwater gleys, lithosols and regosols, acid brown earths and brown podsols, deep peaty gleys, alluvium soil) with basin and blanket peats also present in areas. The elevation of the forestry areas varies from c. 100 to 135 metres above sea level. The development boundary incorporates a number of streams, and a lake waterbody as outlined in Table 1.1. The site also contains and is contiguous to sites and monuments of archaeological interest, some of which lie within existing forestry: Mass-rock (LH021-010----); Standing stone (LH021-009----); Fulacht fiadh (LH021-052----); Standing stone (LH021-024----); Excavation – miscellaneous (LH021-084----).

Table 1.1: Aquatic zones within development area.

Waterbody name	EPA code
Slieveboy 06	06S16
Drumshallon Lough Stream	06D03
Piperstown Stream 06	06P02
Drumshallon (Lough)	-

The wind farm footprint does not overlap with any designated conservation areas (i.e. NHAs, SACs or SPAs), though it is hydrologically connected to the Boyne Coast and Estuary SAC (001957) through the Drumshallon Lough (06D03) and Piperstown (06P02) streams, both of which join the Termonfeckin 06 (06T01) river - flowing easterly until joining the SAC at the coastline. The nearest designated conservation area is the River Boyne and River Blackwater SAC (002299), which is located c. 6.4 km southwest of the proposed site. There are several other designated areas within 15 km of the development site, as outlined in Figure 1.2 and Table 1.2.



Basemap: World Imagery (Sources: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA FSA, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopt, and the GIS User Community)

Figure 1.2: Designated conservation areas within 15 km of development area.

Table 1.2: Designated Conservation Areas within 15 km of development area.

#	Name	Site Code
1	River Boyne And River Blackwater SAC	002299
2	Boyne Coast and Estuary SAC	001957
3	Dundalk Bay SAC	000455
4	Clogher Head SAC	001459
4	River Boyne and River Blackwater SPA	004232
5	Boyne Estuary SPA	004080
6	Stabannan-Braganstown SPA	004091
7	Dundalk Bay SPA	004026
8	River Nanny Estuary and Shore SPA	004158

1.2 Description of existing forestry within proposed development area

The development area encompasses approximately 94.8 hectares of commercial forestry, all of which is privately owned. Beyond basic timber production, the range of benefits that these forests cover is limited but would encompass some biodiversity, conservation, environmental protection, rural development and carbon sequestration. Figure 1.3 illustrates the locations of all the private forestry plots within the proposed wind farm development area.

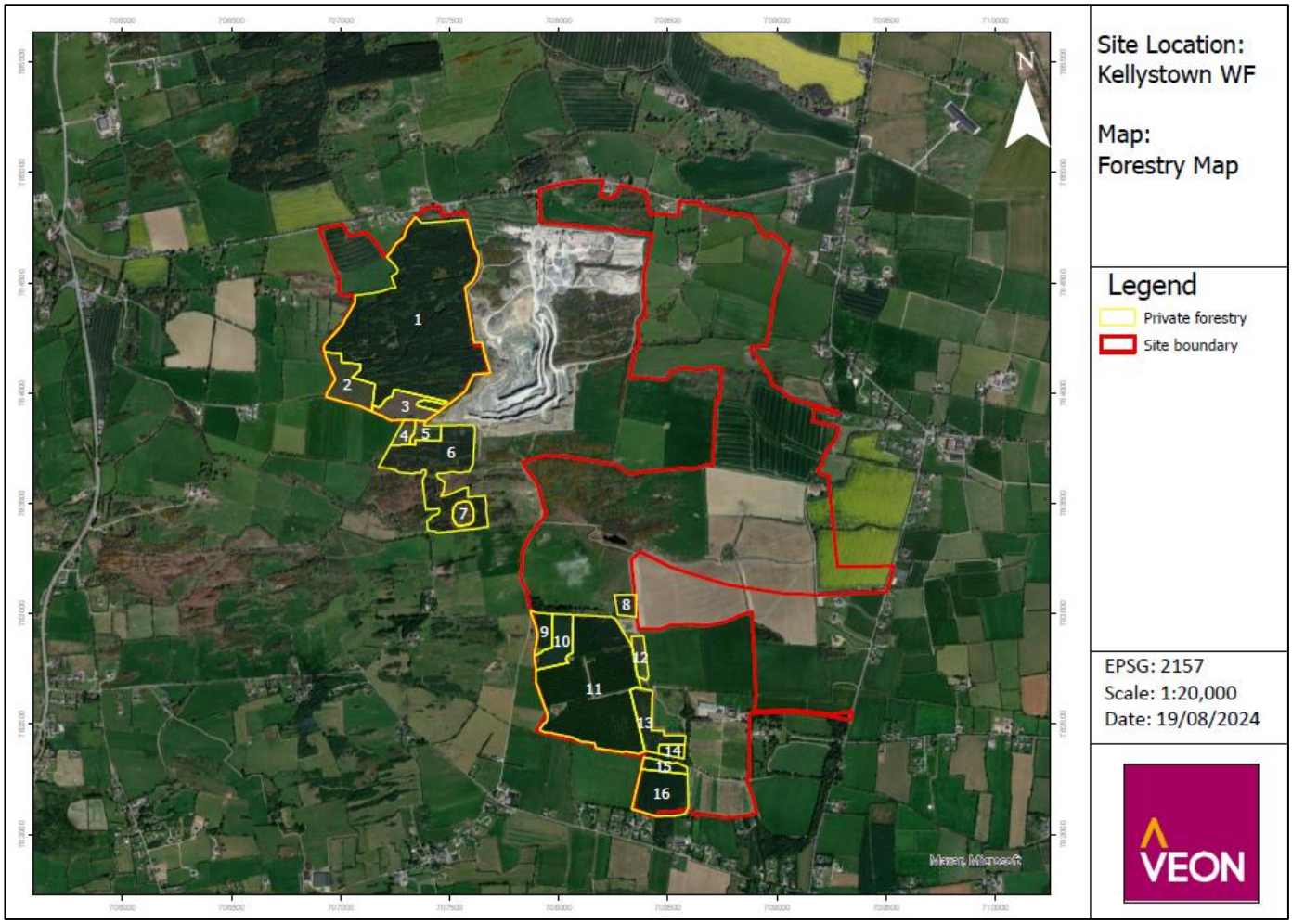


Figure 1.3: Existing forestry plots within proposed development area.

The construction of the proposed wind farm infrastructure (i.e. hardstands; turbines etc.) could have varying levels of impact on existing forestry, and the felling of trees will be required at two of the five proposed turbine locations. The planned access roads for the wind farm are also due to traverse through one of these forestry plots. A summary of the affected plots is presented in Table 1.3.

Table 1.3: An overview of forestry plots affected by the proposed wind farm infrastructure.

Infrastructure	Forestry plot	Tree Species Present	Planting Year	Top height (m)	Est. Yield Class	Plot Area (ha)
Access Road	**1**	Norway spruce; Sitka spruce; Japanese larch	1999	14	20; 20; 10	39.05
T1	**1**	(as above)	-	-	-	-
T1	**3**	Sycamore	1999	17	12	2.68
T5	**8**	Sitka spruce	1965	20	8	0.88
T5	**11**	Norway spruce	2002	14	22	21.26
T5	**12**	Unplanted	-	N/A	-	1.05

The forestry to be felled within the red line boundary area is mostly characterised by good timber quality - containing trees that are growing well, and which would otherwise grow on to produce high-quality sawlog (i.e. the most profitable wood product that is widely used for construction) at the end of each rotation. The proposed wind farm road layout will likely benefit future harvesting operations in the area, providing additional access options and will aid in the removal of timber.

1.2.1 Forestry plots interacting with the proposed wind turbine footprint

Figure 1.4: Existing forestry in plot 1.

Figure 1.4 illustrates the existing commercial forestry within the plot 1, where some of the proposed access roads and the infrastructure for wind turbine T1 are due to be constructed.

This plot is at an elevation of approximately 119 metres above sea level and was planted with a mixture of Norway spruce (*Picea abies),* Sitka spruce (*Picea sitchensis)* and Japanese larch (*Larix kaempferi*). The plot is underlain by mineral soil derived from mainly non-calcareous parent materials and ground conditions were dry during the site visit.

Evidence of recent thinning was noted in the plot, and the trees here will be due for additional thinning in the next 4–5 year period. The trees currently have an average top height of 14 metres and were observed to be growing well in this location.

Figure 1.5: Existing forestry in plot 3.

Figure 1.5 shows the current broadleaf forestry within the forestry plot 3, where existing trees are due to be felled to accommodate the turbine hardstand and the required bat buffer distance for turbine T1.

This plot is at an elevation of c. 123 m above sea level and has been planted with Sycamore (*Acer pseudoplatanus).* The trees have an average top height of 17 metres and are displaying good growth overall. These trees have not been thinned to date but would be due for thinning soon. The plot is underlain by mineral soil and ground conditions were wet here during the site visit.

Figure 1.6: Existing forestry in plot 8.

Figure 1.6 illustrates the current forestry within the private forestry plot 8, where existing trees are due to be felled to accommodate the turbine hardstand and the required bat buffer distance for turbine T5.

This plot is at an elevation of c. 108 metres above sea level and comprises mature Sitka spruce with no signs of recent thinning having occurred. The trees were observed to be growing well at this location, with a top height of 20 metres recorded. This plot is underlain by mineral soil and ground conditions were also wet here during the site visit.

Figure 1.7 illustrates the current forestry within plot 11, sitting at an elevation of approximately 116 metres above sea level, where existing trees are due to be felled to accommodate the infrastructure for turbine T5. This plot comprises Norway spruce (*Picea abies*) which has been previously thinned and will be due for subsequent thinning in the next 1-2 years. The trees are displaying good growth in this area, and a top height of 14 metres was recorded. This plot is

underlain by mineral soil derived from mainly non-calcareous parent materials and ground conditions were dry during the site visit.

Figure 1.8 illustrates the dense vegetation currently growing within plot 12, where no forestry species were noted during the site visit.

Figure 1.7: Existing forestry in plot 11.

Figure 1.8: Dense vegetation in plot 12.

1.3 Existing forestry and certification

Forest certification is a process through which the quality of forest management is assessed against an agreed set of standards and principles. It is a voluntary process that promotes the monitoring of forests and the labelling and tracing of logs and wood/non-wood forest products. The certification of forests is underpinned by two key processes:

- Examining forests to see if they are being managed in line with a measurable set agreed set of standards and objectives. This involves an independent third-party assessment by a professional auditor of a forest owners' management practices against the standards that are set out in a forest management plan.

- The labelling of timber that has been harvested from a well-managed forest, known as Chain of Custody (CoC) Certification: this involves an independent third-party chain of custody inspection to trace timber harvested in certified forests through all subsequent stages of processing, marketing and transport.

Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) are the two international forest certification schemes that are currently operating in Ireland (Teagasc, 2021).

The private forests impacted by this wind farm development are not currently being managed under forest certification.

2. Potential impacts of the proposed development

Compared to many other EU countries, the wind climate in Ireland is lively, with high rainfall and gales prevalent, which can give rise to trees blowing over in forestry stands and renders wind the major abiotic factor affecting Irish forestry (Ní Dhubháin, 1998). The resilience of a tree or trees to wind forces is influenced by a multitude of factors including site, stand and tree characteristics (Peltola *et al.*, 2013). On a wider level, topography and the windiness of the regional climate are important functions in wind damage of forests (Miller, 1985).

As outlined by Quine et al. (1995), trees have two principal resistive forces to blowing over - root anchorage and crown contact with adjacent trees. The susceptibility of trees to wind damage is also influenced at the crop level by tree height and tree species (Albrecht *et al*., 2012) and the underlying soil conditions (Miller 1985).

This section provides an overview of tree and wind turbine interactions and outlines the potential impacts of the proposed wind farm on existing forestry in the development area.

2.1 The potential impact of trees on wind turbines

A forestry crop, with a typically rough and uneven canopy, acts as a barrier to the wind and can cause wind shears (i.e. changes in wind speed and direction). Forestry in proximity to a wind turbine can give rise to substantial turbulence than what would otherwise occur over more open ground. This can reduce the overall wind speed above the forest canopy and turbulent airflow can send vibrations through the turbine blades, leading to increased stress on the turbine drive trains and a reduced capacity to exploit wind-generated energy (Department of Agriculture, Food and the Marine, 2017; Irish Wind Energy Industry, 2012).

2.2 The potential impact of wind turbine development on trees

The felling of coupes of trees to accommodate a wind farm has the potential to adversely affect the remaining forestry and the wider local environment. Where large areas of a forest canopy are opened during felling for a wind farm, newly exposed edge trees—that would now stand immediately adjacent to the coupe—will have reduced capacity to absorb wind forces as the support of neighbouring trees has been removed. These trees will not have had time to adapt to the new wind environment, thus rendering them vulnerable to blowing over (Mitchell, 1995; Peltola *et al.,* 2013; Quine and Gardiner, 2007). Additionally, the wind blowing on the opened canopy will now typically be more turbulent and the soil beneath the canopy gaps will be increasingly exposed to precipitation, which may reduce its resistance to erosion (DAFM, 2000).

Figure 2.1: An example of windblown conifer trees on a commercial forestry site.

Once trees begin to blow over nearby trees are at risk of either being hit by the falling trees - which can cause stem breakage or canopy loss; or as a consequence of the creation of gaps - which will allow the wind to penetrate further into the canopy (Quine and Gardiner, 2007).

Other potential impacts include damage to existing drainage networks - which could give rise to waterlogging and enhance the risk of additional windblow as the rooting and stability of trees are reduced (Ní Dhubháin and Farrelly, 2018), and woody debris entering waterways: debris from windblow events can cause excessive shading or a change of flow patterns in aquatic zones and limit the movement of fish (Giller et al. 2002) or wildlife in an area (Mitchell, 1995).

2.3 The potential impact of the proposed development on existing forestry

The existing forestry within the proposed wind farm site has been grown thus far as part of a silvicultural rotation, which would be due for harvesting in the future, irrespective of whether a wind farm was being implemented or not.

To facilitate the various wind farm infrastructures, approximately 9.39 hectares of commercial forestry would need to be removed in advance of the construction phase. As shown in Figure 2.2, the proposed locations for wind turbines T2, T3, and T4 are located beyond the perimeters of forestry plots, and therefore, the construction of the same would not have any effect on existing trees. However, the plots surrounding the proposed locations of turbines T1 and T5 would potentially be affected by the construction works – the remainder of this section outlines the perceived potential impact of tree-felling operations following an on-site survey of the forestry at the Kellystown site.

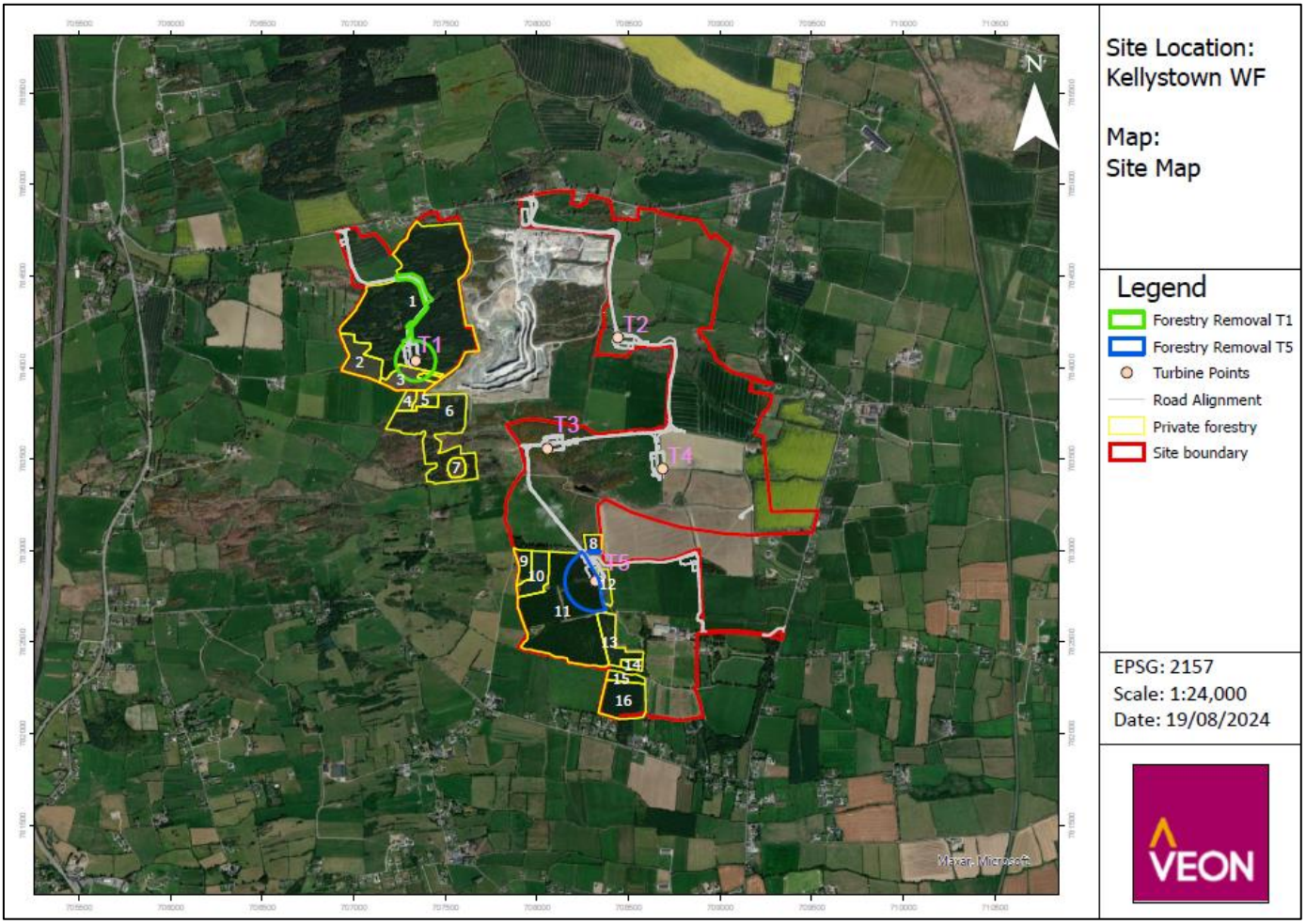


Figure 2.2: Proposed wind turbine locations within project development area

2.3.1 Potential impact of proposed access roads

Affected forestry plots:	Soil type(s):	Tree species present:	Top height (m):	Ground conditions:
Plot 1	Mineral	Norway spruce (NS); Sitka spruce (SS); Japanese Larch (JL);	14	Dry

Perceived potential impact:

A linear section of coniferous trees within plot 1 are due to be felled to facilitate the construction of access roads which will lead to wind turbine T1. The trees here are of a current top height of 14 metres and are underlain by mineral soil derived from mainly non-calcareous parent materials where ground conditions were observed to be dry. While some snap or blow amongst newly exposed edge trees along the road clearing may be expected, felling to facilitate the access roads should not increase the risk of extensive wind damage as the remaining trees will have time to adapt to the new conditions and stabilise before the risk of endemic windblow arises.

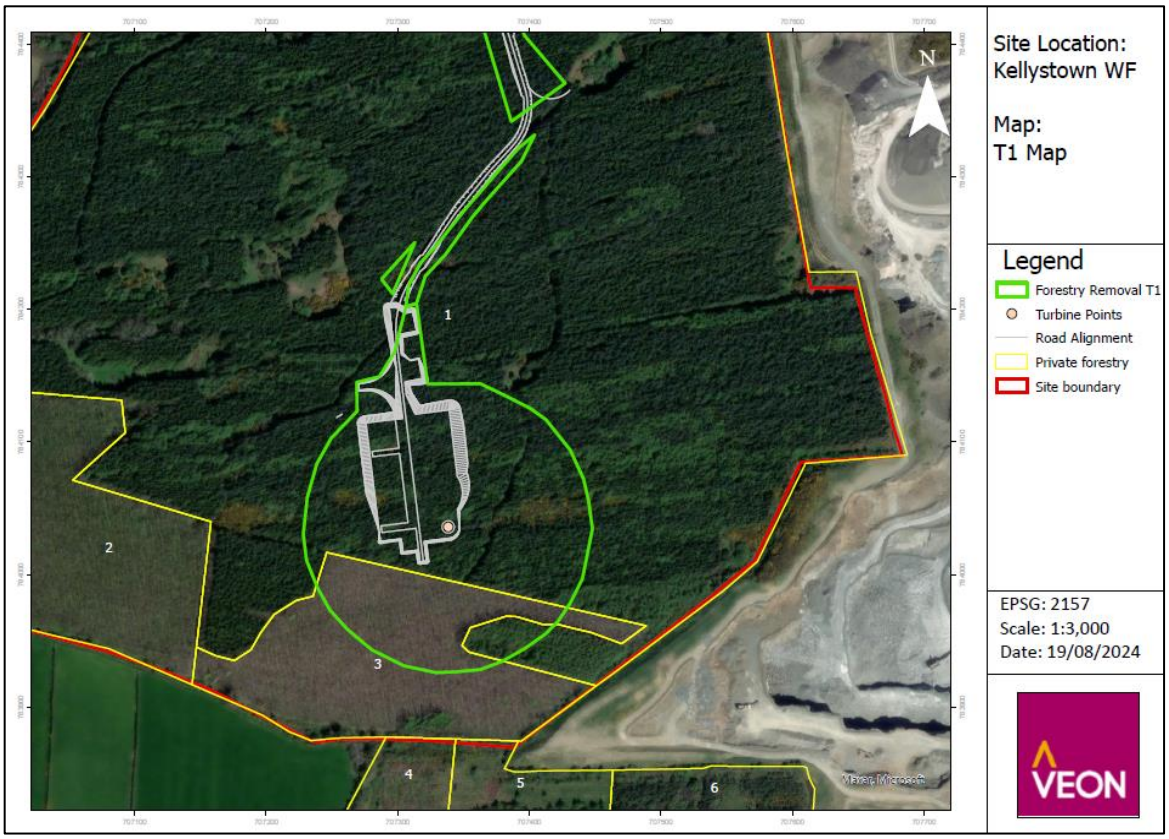
2.3.2 Potential impact of wind turbine T1 (including hardstand and bat buffer distance)

Affected forest plots:	Soil type(s):	Tree species present:	Top height (m):	Ground conditions:
Plot 1; Plot 3	Mineral	Plot 1 – NS; SS; JL; Plot 3 – Sycamore (SYC)	Plot 1 - 14 m; Plot 3 - 17 m	Plot 1 - Dry; Plot 3 - Wet

Perceived potential impact:

The proposed location of turbine T1 coincides with forestry plots 1 and 3 as shown below. Infrastructural 'keyhole' felling within plot 1 would create new openings within the forest and thus create new forest edges. However, given the underlying soil and current top height of the coniferous trees, the remaining stems should have time to stabilise and adapt to the new canopy conditions before the risk of adverse windblow materialises.

A section of sycamore trees in plot 3 would also be removed during infrastructural felling with the remaining trees having a windfirm edge against the prevailing wind direction (i.e. SW). These trees have not been thinned to date. While the height profile of these trees would typically put them at higher risk, this is a broadleaf plot, rendering it less susceptible to wind damage (Ní Dhubháin and Farrelly, 2018). However, some snap can be expected amongst the newly exposed edge trees and some of these trees may blow over following the planned keyhole felling.



2.3.3 Potential impact of wind turbine T5 (including hardstand and bat buffer distance)

Affected forest plots:	Soil type(s):	Tree species present:	Top height (m):	Ground conditions:
Plot 8; Plot 11; Plot 12	Mineral	Plot 8 – SS; Plot 11- NS; Plot 12 -Unplanted	Plot 8 – 20m; Plot 11 – 14m	Plot 8 - Wet; Plot 11 - Dry

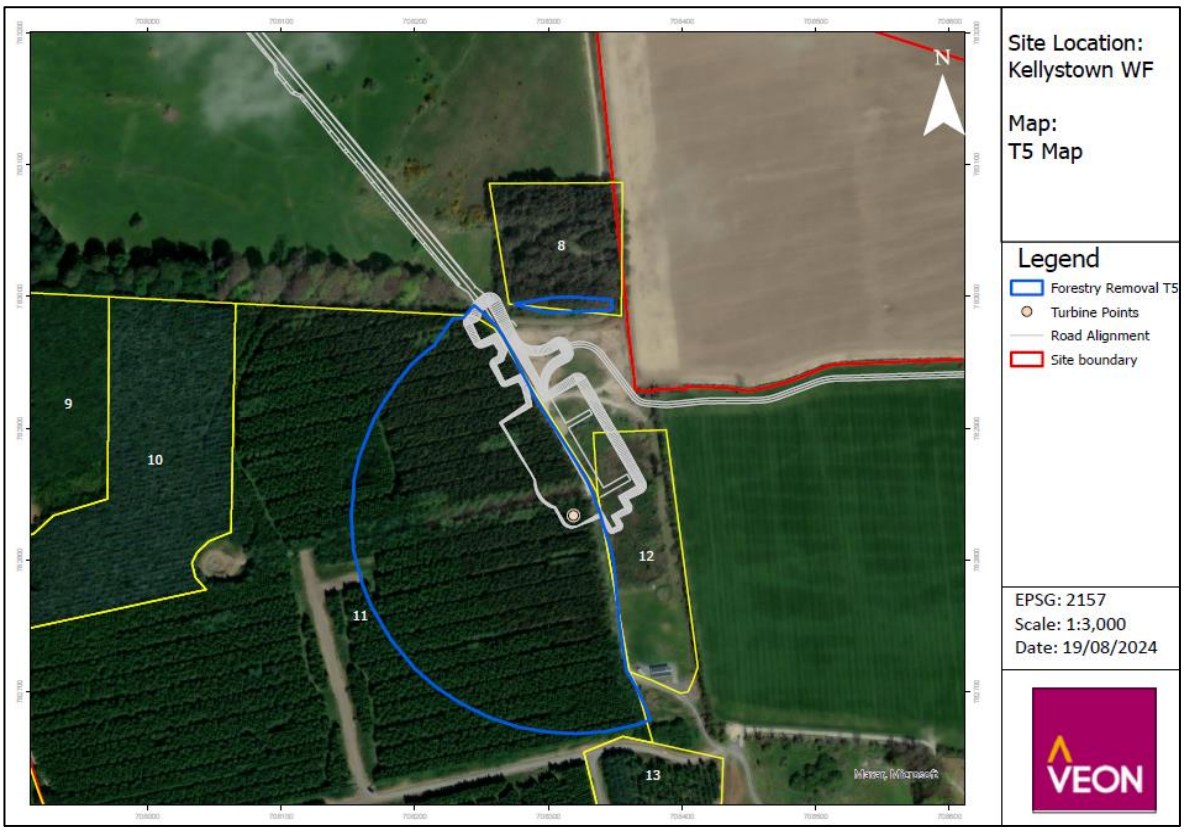
Perceived potential impact:

The proposed location of wind turbine T5 (and associated infrastructure) overlaps with the private forestry plots 8, 11 and 12 as shown below.

Plot 8 is a small plot containing a mature Sitka spruce forest, which has likely surpassed optimal commercial value. The trees here have a top height of 20 metres, though have likely developed stable root systems as the trees have matured. This plot was planted long before the plots adjacent and also would be somewhat sheltered from prevailing winds by the remaining spruce trees in plot 11, so infrastructural felling here should not increase the risk of wind damage.

Plot 11 contains a commercial crop of Norway spruce that is displaying good growth over mineral soil. The trees have received a light thinning and will be due for subsequent thinning in coming years. Following felling, while some snap and windblow of trees can be expected along the new forest edge, the remaining trees should have time to stabilise and adapt to the new canopy conditions before the risk of adverse windblow arises, and the remaining forestry within the plot will form a barrier to the prevailing winds.

Plot P12 was observed to be currently unplanted, with dense vegetation present, so the risk was not considered here.



2.3.4 Additional considerations

For mature forestry located on moderately sloping ground, the harvesting method for any clear-felling programme will comprise mechanised harvesting and extraction by a wheeled forwarder. Harvesting operations within forested areas has the potential for several negative impacts:

- **A loss of wildlife habitats** - the effects of loss or change of habitat are considered in the biodiversity chapter of the EIAR. However, the following observations are made concerning the proposed development:

- On a county level, the 9.39 hectares of forestry that would be removed on a permanent basis represents c. 0.39 % of the available forestry habitats in Co. Louth[1] and therefore is considered minor and not significant. Furthermore, the total area of forestry permanently removed would be planted on a compensatory basis on replacement land(s) and thus does not present an overall wider loss of forestry habitat. Where conifer species are replanted on replacement lands, these must now include a 20% broadleaf component under the Forestry Programme 2023-2027, which will provide benefits to the local environment.

- **Increased soil particles or wood residues entering watercourses** - issues relating to potential water pollution from construction activities are dealt with in the Biodiversity, Soils, and Water chapters of the EIAR. However, the following observations are made concerning the proposed development:

- The risk of particles and residues entering watercourses during felling operations for a wind farm development is no different from the risk arising from regular harvesting of forest crops. Provided the appropriate guidelines are followed, and their use strictly enforced during harvesting operations, the risk of adverse effects should be reduced where tree felling is concerned.

- **A loss of carbon sequestration potential –** upon removal of trees from the development area the overall carbon sequestration of the affected forests is reduced. However, the following observations are made concerning the proposed development:

- The removal of trees to facilitate the construction of wind farm is a temporary effect, as an equivalent area of replacement land(s) must be planted to compensate for the felled trees. A proportion of trees felled as part of this development will be converted to construction timber and used in buildings where carbon will be stored in the long term.

- **An increase in road traffic during the extraction phase and noise disturbance** – the felling of trees will require timber lorries to transport the felled logs from the site. However, the following observations are made concerning the proposed development:

- Noise generated on the development site would derive from harvesting machinery and timber haulage vehicles. The level of noise that would arise during harvesting is not considered a significant issue, as it would occur during daylight hours, would be short-lived and would resemble noise created by agricultural machinery in the surrounding environs. Additionally, a major increase in road traffic arising from timber haulage trucks would not be expected, and any increase from existing felling plans would likely be moderate and a temporary inconvenience.

[1] Based on Ireland's National Forest Inventory 2022 – Department of Agriculture, Food and the Marine. Available at: gov - Ireland's National Forest Inventory (NFI) (www.gov.ie)

3. Felling Operations

Felling (i.e. timber harvesting) describes the cutting and extraction of timber to the roadside, usually during thinning or clear-felling operations and **can only be conducted when a tree felling licence has been approved.** A felling licence is granted by the Minister for Agriculture, Food, and the Marine, and provides authority under the Forestry Act 2014 to fell or otherwise remove a tree, or trees, or to thin a forest for silvicultural purposes. The Forestry Act 2014 prescribes the functions of the Minister and details the requirements, rights, and obligations associated with tree felling licences. The Forestry Regulations 2017 (S.I. No. 191 of 2017) are the principal set of regulations giving further effect to the Forestry Act of 2014.

3.1 Harvesting types

3.1.1 Thinning

Thinning is a silvicultural intervention that removes inferior-quality trees from a stand. It affords the remaining stems with more growing space and resources, thereby increasing the overall quality and size of the remaining forest and producing a more saleable product. The resulting gaps in the canopy also permit more sunlight and rainfall to reach the underlying soil, increasing soil temperature and levels of moisture which will promote the growth of ground flora (Kerr and Haufe, 2011).

First thinning in conifer forests typically involves the complete removal of every sixth or seventh line of trees (called racks) to gain access into a forest, while inferior trees are then selected for removal between these racks. The resulting timber is generally used for pulpwood, fencing, pallet products or wood energy (Teagasc, 2013).

3.1.2 Clear-felling

Clear-felling describes the harvesting of all marketable trees in a given stand at the end of a forest rotation, which is generally followed by replanting of the stand to replace the harvested trees (DAFM, 2000b). Clear-felling typically occurs when a conifer forest is 30-40 years old, and much later for a broadleaf forest (≥ 100 years old).

3.1.3 Continuous Cover Forestry (CCF)

CCF is an alternative silvicultural approach to clear-felling where trees are periodically removed from a forest, though the forest canopy is permanently maintained, and no felling coupes are formed. As outlined in DAFM (2017), CCF is applicable where timber production is an objective but where other considerations (e.g. biodiversity; water protection; recreation) would benefit from a continuous forest cover, or where a conifer plantation is to be converted into a native woodland owing to proximate environmental sensitivities (e.g. a high-status objective waterbody).

3.2 Harvesting operations

Harvesting within a forestry context typically describes the felling (i.e. cutting down) of standing trees, the removal of lop and top (i.e. branches and brash wood), the cross-cutting of felled stems into size categories, the extraction of timber and the stacking of the log assortments by the roadside. During wind farm construction, keyhole felling is typically carried out which concentrates on the felling of trees standing within the wind farm infrastructure layout. Turbulence felling may also occur, where trees proximate to wind turbines are removed to preclude air turbulence

that would otherwise be created by the forest canopy, as this can adversely affect the wind turbine components (and therefore performance) over time.

3.2.1 Mechanised felling of standing timber

Mechanised timber harvesting is the predominant method for tree felling in Ireland today. This involves the use of specialised harvesting heads, fitted to a purpose-built ground-based machine called a **harvester**. A typical harvesting machine is illustrated in Figure 2.3. Harvesters comprise a base machine, which houses a harvesting head mounted onto a hydraulic arm. Modern harvesters are very efficient and will cut down a tree, delimb it and cut the stem into desired lengths in less than 60 seconds. The machine operator controls the movement of the machine from the harvester cab, which contains an onboard computer system that can be programmed to cut standing trees to the size and length specified by the customer. The harvester will process trees down to 7 cm in size. The remainder of the tree will be placed on the rack in front of the harvester, along with the branches, to act as a brash mat for the harvester to travel on, reducing the risk of soil damage. If required, a harvester can be modified into a low-ground pressure machine that can work across multiple site conditions. To minimise ground disturbance or damage, the wheels on a harvester may also be fitted with tracks or chains, depending on the relevant ground conditions.

Figure 3.1: A typical forestry harvester delimbing a tree.

As the harvester works down a rack, it places processed logs to the side where they will be easily accessible for extraction to the roadside. In conifer stands, as the harvester cuts each tree, it will apply a urea solution to the surface of the remaining tree stump. Urea is applied to prevent the potential colonisation of *Heterobasidion annosum* fungal spores: this is a serious fungal disease (otherwise known as conifer root and butt rot) that can grow down through root stumps and cause extensive decay in the lower stems of conifer trees[2]. Urea application is typically a condition of a tree felling licence unless the trees are within an aquatic zone buffer zone/setback area or on deep peat soil.

[2] Conifer root and butt rot (Heterobasidion annosum) - Forest Research

3.2.2 Manual felling of standing timber

Up to the early 1990s, manual felling using a **chainsaw** was the predominant felling type. Today, it remains a useful option in small-scale forestry, or where trees stand within a buffer zone/setback area - outside the reach of the harvesting arm and where machinery access is limited or precluded.

3.2.3 Timber extraction

In an Irish forestry context, **s**pecialised wheeled **forwarding machines** (as shown in Figure 2.2) are currently the most widely used timber extraction system. A purpose-built forwarder contains a base machine similar to a harvester but comprises a powered trailer with a hydraulic grapple arm attached and will typically require transportation by a low-loader semi-trailer. A forwarder typically follows a harvester to collect and extract logs to the roadside, where assortments will be carefully stacked for loading onto timber haulage tracks. Like harvesters, forwarders can be fitted with tracks or chains and can remove on average c. 9-12 tonnes per journey.

Figure 3.2: A forwarder stacking logs at a designated stacking bay.

4. Mitigation measures

The harvesting of forestry crops holds the potential to adversely affect forestry habitats and the wider local environment, with soil erosion, sedimentation and nutrient enrichment of aquatic ecosystems all a possibility. Thus, in advance of any timber harvesting on the development site, there would be several mitigation measures to be implemented to reduce the risk of adverse impacts. This section of the report provides an overview of the various mitigation measures available for forestry harvesting operations, based on existing DAFM/Forest Service standards and guidelines (DAFM, 2019; DAFM, 2023).

4.1 Mitigation measures for associated harvesting operations

4.1.1 General considerations

All harvesting operations associated with the project must be conducted in strict accordance with the following standards and guidelines, which have been developed by the DAFM/Forest Service:

- Forest Protection Guidelines
- Forestry and Water Quality Guidelines
- Forest Harvesting and Environmental Guidelines
- Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures
- Forestry and Otter Guidelines
- Forest Biodiversity Guidelines
- Forestry and The Landscape Guidelines
- Forestry and Archaeology Guidelines
- Code of Best Forest Practice – Ireland
- Irish National Forest Standard

Other standard mitigation measures include:

- Works only to be conducted by experienced and fully competent operators. Operators must don all appropriate P.P.E. while working on-site.

- A safety statement to be issued to ensure that any dangerous or sensitive areas are well known to all relevant individuals. Additionally, the responsible forester to walk the site with all contractors to highlight any prominent site risks or any sensitive habitats present.

- Up-to-date contingency plans to be designed according to section five of the *Standards for Felling and Reforestation* (2019) and to be triggered if necessary.

- Specific harvest plans to be designed for all associated harvesting operations. These should outline access points, environmental setback areas, timber extraction routes, fuelling and chemical storage areas, log stacking areas, and drain crossing points and include a Hazard Identification and Risk Assessment (HIRA).

- If deemed economically viable, the felling and subsequent extraction of timber should—as far as possible—be conducted at the same time as currently licensed extraction activities to minimise the risk of increased local traffic and noise disturbance.

- Felling and extraction of timber, as far as possible, should be conducted during periods of dry weather. During a period of heavy rainfall, harvesting works should cease until the site has dried out to reduce the risk of siltation, rutting and soil compaction.

- Any drains crossed during the extraction phase to be kept clear of any residues/debris to ensure no drainage issues arise for the remaining trees.

- Exclusion areas must be marked out in advance of harvesting using temporary markers (e.g. bamboo or posts with hi-visibility tape - securely driven into the soil with circa 1.5 metres remaining visible above ground).

4.1.2 Water

In advance of works, a ten-metre exclusion area must be created from the edge of any aquatic zone (i.e. river, stream, or lake) that overlaps with the harvesting area. An additional five-metre exclusion area must be created from the edge of any relevant watercourse present on-site. Harvesting machinery must not encroach upon these areas. Trees within reach of the harvester arm should be felled by the harvester and snedded and bunched outside of the exclusion area. Trees outside machine reach should be felled by a competent chainsaw operator, with all felling directed away from water features. Felled trees can be removed by an extended harvester arm, for subsequent snedding and processing outside the exclusion area. Harvesting works should as far as possible be conducted during periods of dry weather.

Figure 4.1: A silt trap for sediment control on a commercial forest site.

To capture and control suspended sediment, silt traps must be installed within relevant watercourses. These should be constructed with durable materials, along and towards the point of outflow of mound drains, where a firm bank exists, and a ten-metre 'buffer zone' containing sufficient vegetation (e.g. grasses, reeds, and shrubs) to filter out any remaining sediment/nutrients can be implemented between a silt trap and a waterway.

The refuelling and chemical/fuel storage area on the site must be sited in a dry, sheltered and flat location, at least fifty metres from aquatic zones and twenty metres from relevant watercourses and avoiding any exclusion areas. Fuel, oil or chemical containers must not be rinsed out on-site and spent machine oil should be collected for off-site disposal.

Temporary bridging points (TPBs) may be required where it is necessary to cross watercourses during harvesting operations: these may comprise logs lined lengthwise, overlaid with a geotextile membrane and brash to capture falling soil from machinery wheels, and should only be constructed where soil and bank sides are stable. The condition of TPBs must be carefully monitored throughout operations, and TPBs over relevant watercourses should be cleaned out and supplemented as necessary. For aquatic zones, crossings should be avoided as far as possible, though where unavoidable, a clear span log structure must be used. Temporary bridging points must be carefully removed post-harvesting, with due care afforded to avoid dislodging any collected sediment as brash padding is peeled back.

Note regarding replacement lands planting: where an aquatic zone exists within or adjacent to a forestry plot a suitable planting setback area must be implemented based on various site considerations as shown in Table 4.1.

Table 4.1: Planting setback areas for aquatic zones (DAFM, 2023b).

Slope leading to an Aquatic Zone	Planting setback width	Setback width for peat soils or sites within subbasin of a high-status objective waterbody
Moderate (0-15%)	10 metres (from edge)	20 metres (from edge)
Steep (15-30%)	15 metres (from edge)	25 metres (from edge)
Very steep (> 30%)	20 metres (from edge)	25 metres (from edge)

Fertilizer or herbicide should only be applied on a strictly where-necessary basis and during periods of dry and calm weather. These must not be applied within 20 metres of an aquatic zone or other waterway setback areas (including specified distances from open wells, boreholes or water abstraction points as per S.I.155/201).

4.1.3 Soil

Brash mats must be laid along all extraction routes to preserve soil quality, avoiding any waterway exclusion areas. Additional brash should be used to reinforce sections of soft ground that are subject to high levels of machinery passage. Brash mats should be replaced as soon as they show signs of wear, and contractors should regularly monitor all extraction routes for signs of soil damage - using extra brash (where available) to pre-empt the risk of soil rutting. Where ground conditions begin to visibly deteriorate, a new track must be promptly established containing a new brash mat layer (DAFM, 2019).

Once felling works begin, harvesting contractors must only use the designated timber extraction routes and stacking areas as marked on a harvest plan map, and brash must kept out of watercourses and exclusion areas. During timber removal, the extraction route should be directed away from watercourses and the associated machinery must not encroach upon any exclusion areas. Load sizes on forwarders should also be monitored during the timber extraction phase to ensure no overloading occurs and to further reduce the risk of soil compaction or rutting.

4.1.4 Habitats

Tree felling works can lead to fragmentation and a loss of commuting or foraging habitats for wildlife species, and careful consideration must be afforded to the presence of mammal or bird species within the development area. In advance of harvesting operations, an on-site walkover should be conducted to assess the harvesting area for any important habitats that may be present and that require protection during harvesting works, e.g. a ≥ twenty-metre setback area in each direction around a badger (*Meles meles*) sett. Other measures for consideration include:

- The retention and protection of existing hedgerows on a site during harvesting through a five-metre setback area. Hedgerows are often an important habitat for local fauna, providing a source of food (e.g. flowers and berries) and cover for the movement of numerous species across the landscape.

- The retention of old and windfirm broadleaf trees, especially native trees containing deeply fissured bark, cavities and woodpecker or rot holes, which can serve as an important habitat for certain bird and bat species.

- The retention of deadwood during harvesting operations, which may comprise standing dead trees, logs deliberately left behind on the forest floor, or naturally fallen branches or stems.

4.1.5 Archaeology

All guidelines concerning forestry and archaeological features must be strictly adhered to. A ≥ twenty-metre exclusion zone must be created around any listed archaeological monument/feature (SMR) within the development area. Machinery passage and timber stacking must strictly be avoided within this area, and it should be marked out before felling works begin. All tree felling should be directed away from archaeological features.

Harvesting operators should be reminded to remain vigilant throughout operations for any undiscovered archaeological features that may be present on-site. In the event such a feature is discovered, the appropriate authorities (i.e. National Museum of Ireland; the Garda Síochána; National Monuments Service) must be immediately notified, and a ≥ twenty-metre exclusion area must be implemented around the feature until the significance of the find has been investigated.

4.1.6 Landscape

The wider landscape should be considered during replanting works associated with wind farm development, whether it concerns in situ planting or the afforestation of replacement land(s). To foster greater integration into a local landscape straight or horizontal lines in a forest should be avoided wherever possible. This can be achieved by implementing landscape setback areas at the planting stage. Wider and irregular spacing of trees close to the forest edge can also help to buffer conspicuous forest margins, and the planting of native Irish tree species along forest edges can improve the overall visual quality of the forest by providing contrasting textures and colours (DAFM, 2023b).

Consideration must also be given to ensure new forestry will not block light and cast shade on neighbouring properties and public roads, and all guidelines relating to forestry and utilised buildings and public roads must be adhered to:

- A 60-metre planting setback to be implemented from the outer wall of any residential dwellings which are located proximate to forestry. This may be reduced to a 30-metre setback with written permission from a landowner. The planting setback should vary in distance to avoid straight lines of forestry and to produce a more natural scalloped forest edge. Important local viewpoints should also be considered at this stage: these may be retained by introducing open spaces into a replanting operation.

- A ≥ 20-metre unplanted setback from the surfaced edge of any public road which crosses or adjoins a conifer forest. This may include a 10-metre-wide broadleaf strip starting ten metres back from the edge of the road. The setback area should be increased as appropriate to provide greater visibility where a public road bends.

4.1.7 Service Features

All overhead and underground utility lines (e.g. electricity, water or gas) must be identified before works commence. Works that are scheduled to occur near electricity powerlines should be carried out according to chapter seven of the 'Forestry Standards Manual' (DAFM, 2023). Where it is necessary to direct harvesting operations close to or underneath powerlines, safety goalposts and signage must be erected in advance to ensure safe machinery passage.

Note regarding replacement lands planting: where electricity powerlines traverse a site that is due for afforestation a corridor of a certain width must be left unplanted (DAFM, 2023). The width of the corridor to remain unplanted is determined by the voltage of the powerline overhead as illustrated in Table 4.2.

Table 4.2: Unplanted corridor widths for electricity powerlines (DAFM, 2023).

Powerline type	Width of unplanted corridor (centred)
Low voltage (230v / 440 v)	None (branch/treetop clearance only)
10 kV and 38 kV	20 metres
110 kV	61 metres
220 kV	68 metres
400 kV	74 metres

It is important to note that the unplanted area beneath a powerline cannot be considered as replacement land area. However, as it will be left unplanted and no longer farmed, it will in time develop into a natural habitat for the benefit of local biodiversity.

4.1.8 People

In advance of any timber harvesting operations, all relevant prohibitive and safety signage should be erected on and around the site, and emergency contact numbers should be kept available on-site.

To control levels of noise and light pollution at the development site, timber harvesting should be restricted to specific working hours, and throughout harvesting works, any proximate public roadways or right of ways must be kept clear of any harvesting debris or residues.

Figure 4.2: A forester supervising the loading of a timber haulage truck.

Timber stacking areas should be located at least 100 metres from residential properties wherever possible, and supervision by the responsible forester(s) should include confirming hauliers leave timber stacks in a safe and stable condition during the removal of timber from the site.

Where replanting has occurred, the use of fertiliser or an appropriate herbicide must be conducted in full accordance with best practice as per the Forestry Standards Manual (2023) - Herbicide should not be applied where high winds or heavy rain are forecast or within the 60-metre planting setback area for any residential dwellings.

5. Replanting Obligations

In most circumstances, the clear-felling of forestry will be subject to a replanting obligation, which is included as a condition of a felling licence.

5.1 Overview of felling categories and associated requirements

Forest Service policy outlines different tree removal scenarios, as described in the *Felling and Reforestation Policy*[3] document (DAFM, 2017). Table 5.1 summarises the six main scenarios where permanent tree removal is permitted, and whether alternative afforestation and/or the repayment of grants and premiums are required.

The wind farm development at Kellystown relates to 'Scenario 2' in Table 5.1 and would thus require the submission of a felling licence for the consideration of the Department. The Forest Service would subsequently notify the applicant if the removal of trees has been approved or not. If approved, tree felling typically may not commence until 14 working days have elapsed after the date of signature on the licence. Several conditions may be attached to the licence which must be strictly adhered to during felling works. For example, these may typically include the treatment of conifer stumps with fertiliser-grade urea to mitigate against the forest pathogen *Heterobasidion annosum*, and the responsibility of the landowner to ensure any wild animals protected under Wildlife Act 1976 - 2010 are not impacted by the forestry operations associated with the licence. Where deforestation approval is granted, requirements for the replanting of replacement land(s) would be specified in an alternative replanting condition.

[3] Available at: https://www.gov.ie/en/publication/19b8d-tree-felling-licences/.

Table 5.1: Scenarios where permanent removal of forest may be considered (DAFM, 2017).

Scenarios	Felling Licence application required?	Alternative afforestation required? (See Note 1)	Refunding of grant & premiums required? (See Note 2)
1. Overriding environmental considerations (e.g. to protect habitats and species listed as qualifying interests within SACs and SPAs)	Yes	No	No
2. Supporting renewable energy and energy security (e.g. windfarm installation)	Yes	See Table 6	See Table 6
3. Commercial development (e.g. development of an industrial park)	Yes	Yes (see Note 3)	Yes
4. Conversion to agricultural land (see Note 4)	Yes	Yes	Yes
5. Public utilities (e.g. erection of an electricity power line)	No (see Note 5)	No	Yes
6. Other land use change (may be considered on a case-by-case basis, on application)	Yes	Case-by-case	Case-by-case

'Table 6' as referred to in Table 5.1 above is represented in this report as Table 5.2, which illustrates the requirements for each category of tree felling associated with wind farm development.

Table 5.2: Requirements for each felling category associated with wind farm development (DAFM, 2017).

Category of tree felling		Reforestation of felled area required?	Alternative afforestation required? (See Note 1)	Refunding of grant & premiums required? (See Note 2)
Infrastructure felling		No	Yes	Yes
Construction felling		Yes	No	No
Turbulence felling	≤20 ha	Yes	No	No
	>20 ha	Yes	Yes, 10% turbulence fell area – see Section 5.3.2.4	No

Note 1 If 'YES', the alternative site must be of an area equivalent in size. Section 5.7 sets out the procedures required. If the forest area proposed for permanent removal is still in receipt of premiums and / or is still in contract under the Afforestation Grant & Premium Scheme, the alternative site may be eligible under the Afforestation Grant & Premium Scheme.

Note 2 If 'YES', the refunding of any afforestation grants and premiums already paid out by the Forest Service is required if the forest area proposed for permanent removal is still in receipt of premiums and / or is still in contract under the Afforestation Grant & Premium Scheme. Also, if 'YES' or 'NO', if premiums are still being paid, premium payments on the area will cease.

5.1.1 Infrastructure felling

The permanent removal of trees and forests is permitted only in certain circumstances – this category of tree-felling generally relates to infrastructural felling for wind farm projects, and mitigating measures form part of the decision-making process, including the afforestation of alternative lands and/or the refunding of grant and premium payments already disbursed by the Forest Service.

5.1.2 Construction felling

During the construction phase of a wind farm, there may be forested areas that require the temporary removal of forestry (i.e. construction felling) to facilitate the construction of temporary site compounds or for borrow pits for the extraction of rock aggregate. Once construction works have been completed, this land is then repaired and reforested in situ. The afforestation of alternative land(s) and the repayment of grant and premium payments are not required in these instances - there would be no temporary felling required for this development.

5.1.3 Turbulence felling

Turbulence felling may also be required in the immediate environs of wind turbines to preclude air turbulence that would otherwise be created by the existing forest canopy. As illustrated in Table 5.2, if the total area of forestry subject to turbulence felling is equal to or less than 20 hectares, then no replacement land(s) or refunding of grant and premium repayments is required, though the felled areas must be replanted in situ. It is important to note that upon granting of a licence for 20 hectares (or less) of turbulence felling, if any subsequent cumulative felling is applied for to the Department this will be added to the previous total turbulence felling area, and the rules regarding turbulence felling will now apply to the amalgamated area (i.e. replacement lands may now be required if the total area exceeds 20 hectares). Where a turbulence felling area is greater than 20 hectares then compensatory planting of replacement land(s) equivalent to 10% of the total turbulence area is required, in addition to the replanting of the felled areas on the site.

5.1.4 Compensatory afforestation required for project

To facilitate the proposed wind farm at Kellystown, approximately 9.39 hectares of existing commercial forestry—mostly comprising coniferous forestry and Sycamore—would need to be clear-felled for infrastructural felling purposes (Table 5.3).

As outlined in the Felling and Reforestation Policy (DAFM, 2017), all areas due to be permanently felled would need to be replaced through the afforestation of spatially consistent replacement land(s). The afforestation of any replacement land would first require technical approval by the Minister for Agriculture, Food & the Marine under the Forestry Act 2014, and its consent is regulated under the Forestry Regulations 2017 (S.I. No. 191 of 2017).

The project developer is fully committed to the sourcing of appropriate replacement lands, and a non-grant-aided afforestation licence will be sought from the Department of Agriculture, Food, and the Marine to ensure that all felled areas will be replaced on a compensatory basis.

Table 5.3: Total areas of existing forestry to be removed and replaced during the development.

Infrastructure type	Area of forestry to be removed (ha)	Tree species present	Replacement land required for afforestation (ha)
Temporary storage area	0.00	-	0.00
Compound	0.00	-	0.00
Substation	0.00	-	0.00
Meteorological mast	0.00	-	0.00
Borrow pits	0.00	-	0.00
Access roads	0.91	NS; SS; JL	0.91
Turbine T1	3.91	NS; SS; JL; SYC	3.91
Turbine T5	4.57	SS; NS	4.57
Total:	**9.39**	-	**9.39**

5.1.5 Other considerations

The Forest Service may also require a developer to report on the potential loss of soil and biomass CO^2, and the reduction in productivity of the forest area associated with different wind farm forest management and landscape plans.

The following will also apply concerning the afforestation of replacement land(s):

- The proposed afforestation of alternative land(s) must be evaluated and (if deemed suitable) approved by the Forest Service under the Forestry Act 2014 and associated Regulations before the associated felling licence can be granted.

- The proposed alternative land should be submitted for afforestation approval as early as possible, ideally at the time the felling licence application is submitted.

- Afforestation approval must be applied for by a registered forester using the Afforestation Pre-Approval Form (Form 1) or electronically via iFORIS.

- If the forest area proposed for permanent removal is still in receipt of premiums and/or is still in contract under the Afforestation Grant & Premium Scheme, the alternative site may be eligible under the Afforestation Grant & Premium Scheme.

- The standard procedures regarding the evaluation of afforestation applications generally will apply, regarding referrals, protocols (e.g. acid sensitivity protocol), AA Screening, EIA determination etc.

- It will be a condition of the felling licence (if issued) that alternative land approved for afforestation is planted and managed as forest land by the relevant standards set out in the Forestry Standards Manual (DAFM 2023).

While the impacts of the felling activities are considered at this application stage it is noted the felling of trees at the site for the wind farm construction is subject to and can only occur following the grant of a felling licence by the Forest Service. Planning permission for the project may not be granted or, if granted, may have amendments introduced by condition(s). Therefore, the exact area of forestry to be licenced under a felling licence can only be determined once planning permission for the wind farm project has been granted. An application checklist for a tree felling licence application for renewable energy projects is presented as an appendix.

Furthermore, as previously stated, it will be a condition of a felling licence that a spatially consistent area of land shall be afforested on a compensatory basis for all permanently felled areas associated with the project. The exact area of land(s) required for afforestation can also only be known once planning permission has been granted for the wind farm project. Therefore, the application for felling and afforestation licences can only, in practical terms, be made once planning permission has been granted.

The first step of the process would involve the developer engaging with a registered Forester/Forestry company to prepare and submit a non-grant-aided afforestation licence application and a tree felling licence application to the Department of Agriculture, Food and the Marine (DAFM) for appraisal. These applications must outline in detail all activities required for the sites, including environmental sensitivities, a harvesting plan and associated mitigative measures, ground cultivation and drainage, fencing and fertilization (if required) and tree species to be planted etc. It should be noted that an afforestation licence granted by the Department **expires three years from the date it is approved.**

It is also important to note that under the Afforestation Programme 2023-2027, stringent environmental considerations have been introduced which may preclude part or all of a site from afforestation, and these would need to be considered when evaluating sites for replacement land planting. These considerations include Natura 2000 sites or Natural Heritage Areas, High Nature Value Farmland, Peat soils, Breeding Wader Bird Hotspots, Semi-Natural Grassland and Hen Harrier (*Circus cyaneus*) breeding areas. Depending on the nature of the overlap, submission of a Natura Impact Statement (NIS) or additional ecological, ornithological or soil reports (in accompaniment with the afforestation application) may also be required.

6. Conclusion

To facilitate the various components of the proposed wind farm, the development at Kellystown, Co. Louth would require the removal of 9.39 hectares of existing forestry through mechanised timber harvesting. Under the proviso that the proposed mitigation measures are adopted, no significant residual impacts would be expected.

6.1 Summary of Impacts – Wind Farm Construction Phase

Receptor	Potential Impact	Mitigation Proposed	Residual Effect
Existing commercial forestry	Permanent removal of 9.39 hectares of forestry for wind farm construction	9.39 ha of compensatory afforestation to be undertaken on replacement land(s)	Negligible

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Appendix. Checklist for Tree Felling Licence Applications

1	**A fully completed Tree Felling Licence application** as per DAFM Circular 1 of 2021.	☐
2	Where possible, **a single felling licence application for all permanent felling required in respect of the renewable energy or energy infrastructure project.** The licence application form should list all landowners and include all relevant folio information, and where applicable, include consents from those landowners. Tree felling licence maps should also clearly identify land folios and associated landowners (where applicable). A separate felling application should be made for all construction felling areas.	☐
3	**A Certified Species Map (scale 1:5000)** including the felling areas consistent with the project area and any tree felling areas identified in maps and documents included in the planning permission. *Note: if the relevant forest plots are not all evident at 1:5,000 scale, include as many maps as required at 1:5,000 to highlight all plots, and one map at a larger scale (e.g. 1:10,000) showing all the plots together.*	☐
4	**A Harvest Plan and associated Maps (scale 1:5000)**, as per DAFM Circular 11 of 2019**.** The plan and maps must clearly state and illustrate the harvesting operations that are planned on a site, and detail proposed measures to protect environmental and social features. The plan must describe the project area, environmental receptors (e.g. water features; biodiversity habitats), buffer zones/setback areas, existing infrastructure (e.g. electricity powerlines), the existing/planned forest road, location of crossing points and maintenance/refuelling areas, and operational details (e.g. extraction routes; stacking areas).	☐
5	**A copy of the approved planning permission(s) and any historic planning grants relating to the renewable energy or energy infrastructure project involving tree felling requiring a felling licence(s).** To be submitted via email to felling.forestservice@agriculture.gov.ie and/or by supplying a URL to an online secure document repository which includes the relevant planning documents), if planning is secured at the time of application. DAFM can receive the felling licence and process it to a certain extent, e.g. registration, digitising, referrals, FIRS etc. However, under current policy, DAFM do not issue a felling licence until the grant of planning issues from the first authority (Local Authority or An Bord Pleanála).	☐
6	**A Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) and any environmental reports or other related information submitted to the first Consent Authority (i.e. Local Authority and/or An Bord Pleanála).** To be submitted via email to felling.forestservice@agriculture.gov.ie and/or by supplying a URL to an online secure document repository which includes the relevant planning documents. The EIAR, NIS and other planning documents are required by the Department of Agriculture, Food and the Marine to assess the felling licence application(s). The Department is the second authority in the case of such granted developments. Acting as the consenting authority for tree felling activities, DAFM can take account of the content in the related EIA and NIS for the primary project and use this information to determine if any potential impacts may result from the proposed felling works for a project.	☐
7	**A spatial database of the footprint of the felling areas (i.e. polygon shapefile in the Irish Transverse Mercator (ITM) Coordinate System) consistent with grant of planning for the associated energy development**. To be submitted via email to: felling.forestservice@agriculture.gov.ie	☐
8	**A Tree Felling Licence application cover letter.** This should identify a dedicated point of contact and their relevant contact details for any technical queries that DAFM may have in respect of the felling application, or any related planning documents or spatial data submitted in support of same.	☐

9	Where applicable, **a new NIS that includes any proposed tree felling operations that have not already been considered in the EIAR & NIS for the parent project.**	☐
10	**Replacement land(s) with approval from the Department for compensatory afforestation.** Spatially consistent replacement land(s) need to be approved for afforestation by the Department before a licence can be issued for infrastructural felling or turbulence felling (> 20 ha). The alternative land(s) must also be in the ownership of the licensee seeking the felling licence (i.e. the wind farm developer).	☐