Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

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Planning and Environmental Consultants

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1. INTRODUCTION

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by MKO on behalf of Taurbeg Limited (the Applicant), who intend to apply to Cork County Council (CCC) for planning permission to extend the operational period of the existing Taurbeg Wind Farm (the 'Proposed Lifetime Extension') for an additional 10 years to 2036 after the expiry of its current planning permission in 2026. A concurrent application will also be submitted to Kerry County Council (KCC) for the proposed hen harrier offsetting lands (Proposed Offsetting Measures) proposed as part of the overall project.

The existing Taurbeg Wind Farm comprises 11 no. turbines with an overall ground-to-blade tip height of 108.2m. The wind farm is located approximately 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork. Please see Figure 1-1 below for site location context. Other land-uses within the site include private forestry, peat bogs and agricultural lands.

A full description of the Proposed Project for the purposes of the planning application and the additional elements that form part of the overall project, assessed in this EIAR, is outlined in Chapter 4 of this EIAR.

The existing Taurbeg Wind Farm became operational in 2006 and is connected to the National Grid at the existing Glenlara 110kV Substation. It should be noted that the grid connection does not form part of the accompanying planning application and is assessed as a cumulative project only within this EIAR. See Section 1.4 for further details.

The existing Taurbeg Wind Farm is accessed via the wind farm site entrance off the unnamed local road, in the townland of Taurbeg and is served by a network of existing wind farm access roads.

No construction activities, alterations to the existing wind farm are proposed as part of this planning application, beyond the continued routine maintenance of the turbines and electrical infrastructure during the Proposed Lifetime Extension.

The existing turbines onsite will have reached the end of their permitted operational life in 2026, however they will have only been operating for a period 20 no. year and were commissioned in March 2006. Despite the normal operational life of a turbine being more than this i.e. beyond a 30 year lifespan, as turbine technology and reliability continues to improve, and with strategic replacement of key components such as gearboxes, blades, sensors and electricals. The Bonus (now Siemens) SWT - 2.3-82 turbines, of which 11 no. are present and operating on the existing Taurbeg Wind Farm, these turbines are capable of an extended operational lifetime extension of 10 additional years.

The current proposal is being brought forward in response to local, national, regional and European policy regarding Ireland's transition to a low carbon economy and associated climate change policy objectives. In the context of the current energy and climate crises, it is deemed the most environmentally prudent option to apply to extend the operational life of the existing turbines, rather than allow them to be decommissioned.

1.1.1 References to the Proposed Project

The Proposed Project is being brought forward in response to local, national, regional and European policy regarding Ireland's transition to a low-carbon economy, associated climate change policy objectives and to reduce Ireland's dependence on imported fossil fuels for the production of electricity.

For the purposes of this EIAR:

- Where the 'Proposed Lifetime Extension' is referred to, this relates to the continued 10-year operation of the existing Taurbeg Wind Farm from 2026. This includes all elements within the existing Taurbeg Wind Farm Site as shown in Figure 1-2.
- Where 'the Site' is referred to, this relates to the primary study area for the Proposed Lifetime Extension, as delineated by the EIAR Site Boundary in green and encompasses an area of approximately 112 hectares (ha) as shown on Figure 1-2.
- Where the 'Proposed Offsetting Measures' is referred to, this relates all works associated with the creation of new habitat in the townlands of Knockatee and Coom, Co. Kerry for the purposes of offsetting the potential significant adverse effects on hen harrier due to the continued operation of Taurbeg Wind Farm.
- Where the 'Proposed Offsetting Lands' are referred to, this relates to the lands in which the Proposed Offsetting Measures will take place, encompassing an area of approximately 123.2 hectares (ha).
- Where the 'Proposed Project' is referred to, this relates to the Proposed Lifetime Extension and the Proposed Offsetting Measures. The Proposed Project is described in detail in Chapter 4: Description of the Proposed Project of this EIAR.

1.1.2 Proposed Project Location

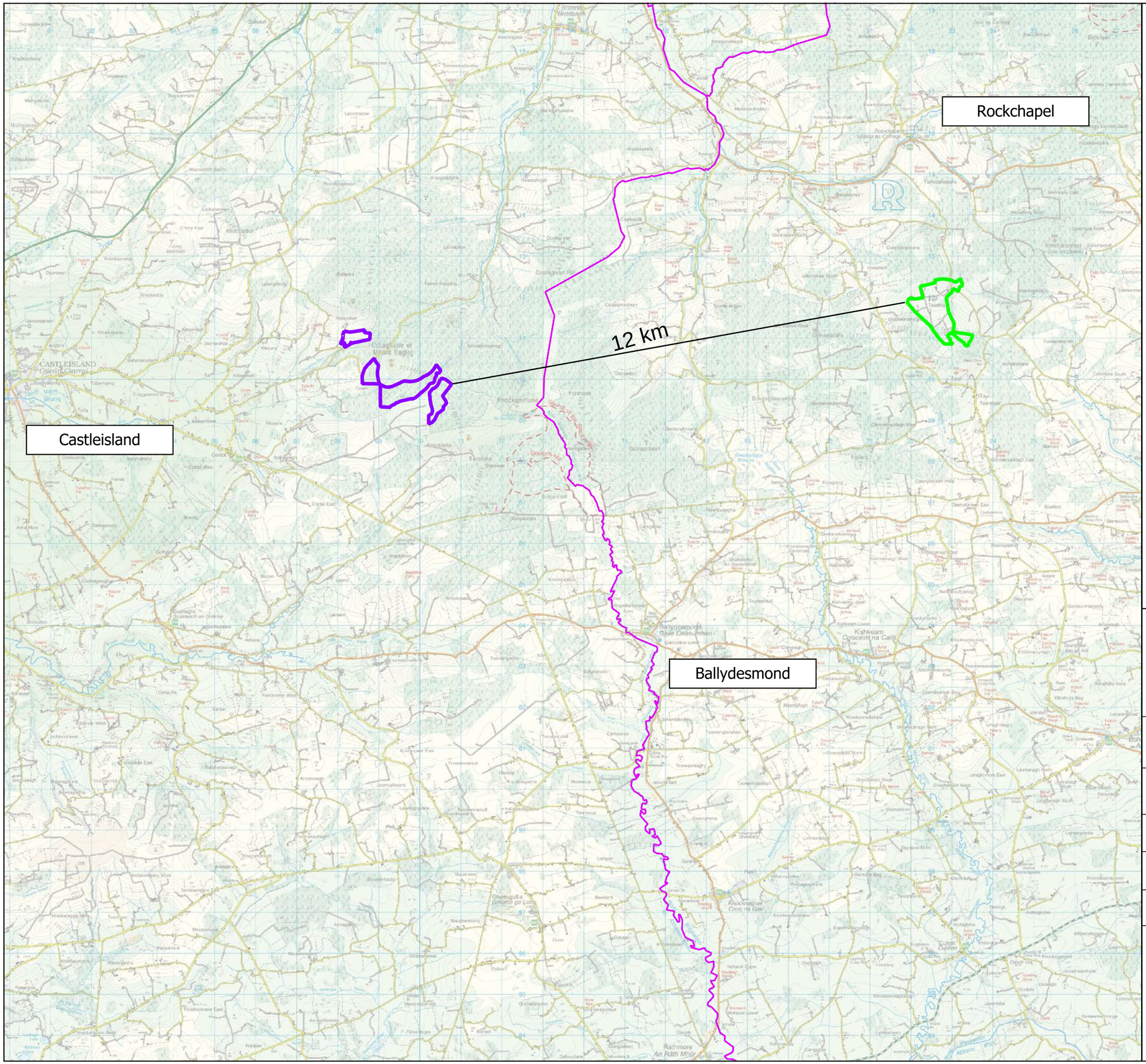
Taurbeg Wind Farm is located approximately 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork, in the townlands of Taurbeg, Glasheenanargid and Taurmore. The approximate grid reference location for the centre of the site is 122541, 111778.

The Proposed Offsetting lands are located approximately 8km east of Castleisland, Co. Kerry in the townlands of Coom and Knockatee. Please see Figure 1-3 below.

The townlands within which the Proposed Project is located are listed in Table 1-1. A site location map is provided as Figure 1-1.

Table 1-1 Townlands within which the Proposed Project is located

Element of Proposed Project	Townland
Proposed Lifetime Extension (Wind turbines and associated foundations and hardstands, site access roads, substation, met mast)	Taurbeg, Glasheenanargid, Taurmore (Co. Cork)
Proposed Offsetting Measures	Coom and Knockatee (Co. Kerry)



Map Legend

- Taurbeg Wind Farm EIAR Site Boundary
- Proposed Offsetting Lands
- County Cork/ Kerry Border

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Drawing Title

Site Location

Project Title

Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	EMcC
Project No. 231030	Drawing No. Figure 1-1
Scale 1:90,000	Date 2025-06-05

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Map Legend

Proposed Lifetime Extension Site Boundary

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Drawing Title
Proposed Lifetime Extension Site Boundary

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	EMcC
Project No.	Drawing No.
231030	Figure 1-2
Scale	Date
1:7,000	2025-06-05

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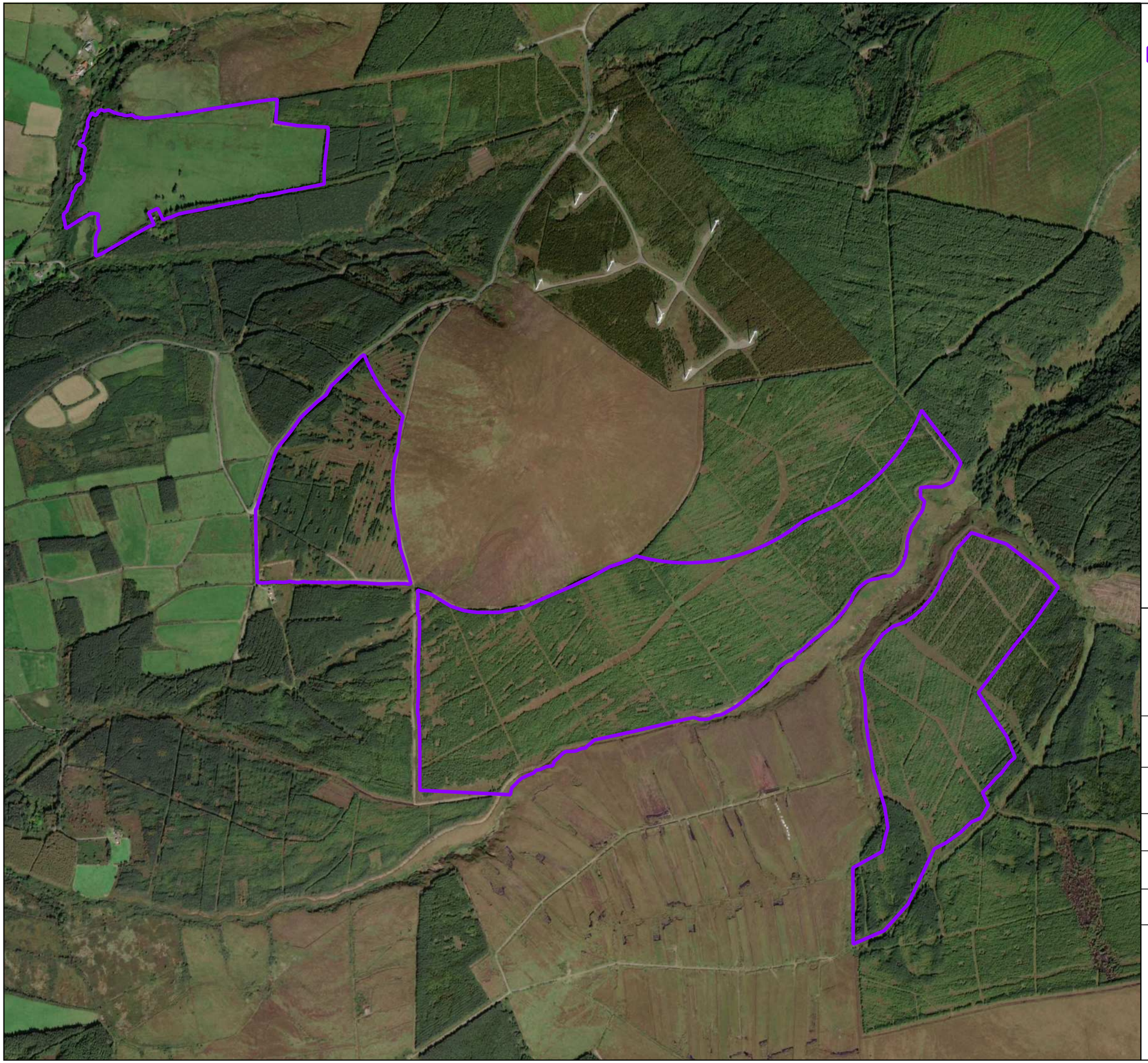

Map Legend

Proposed Offsetting Lands Site Boundary

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Drawing Title
Proposed Offsetting Lands Site Boundary

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	EMcC
Project No. 231030	Drawing No. Figure 1-3
Scale 1:10,000	Date 2025-06-05

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1.1.3 Planning History

The existing Taurbeg Wind Farm consists of 11 no. Bonus (now Siemens) SWT 2.3 megawatts (MW) turbines with a blade tip height of 108.2m.

An Environmental Statement (ES) was prepared to accompany the original application for the 14 no. turbines (CCC Ref N/2002/3608). Permission was granted for the Taurbeg Wind Farm on the 28th of February 2003. The existing Taurbeg Wind Farm has been operational since March 2006, with the current planning permission set to expire in 2026. Planning condition no. 7 of the existing permission (N/2002/3608) states that:

> "*The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development.*"

The existing turbines are due to be decommissioned in 2026. By this date, the existing turbines will have been in operation for only 20 years.

As such, an application is being brought forward for the extension of the operational life of the 11 no. turbine wind farm and supporting infrastructure. The existing Taurbeg Wind Farm has a total rated capacity of 25.3 MW.

The planning background for the existing Taurbeg Wind Farm is detailed further in Chapter 2: Background to the Proposed Project of this EIAR.

The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. The grid connection does not form part of the current planning application. The grid connection was subject to a separate planning application (Pl. Reg. Ref: N/2001/6549) and is now an existing Eirgrid asset. It has been assessed cumulatively with the rest of the wind farm infrastructure, as part of the EIAR.

1.2 Legislative Context

1.2.1 Environmental Impact Assessment

The consolidated European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive'), has been transposed into Irish planning legislation by the Planning and Development Act 2000 as amended and the Planning and Development Regulations 2001 as amended. Directive 2011/92/EU was amended by Directive 2014/52/EU which has been transposed into Irish law with the recent European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018). Most of the provisions of the new regulations came into operation on the 1st of September 2018 with a number of other provisions coming into operation on the 1st of January 2019.

This EIAR complies with the EIA Directive as amended by Directive 2014/52/EU.

The Environmental Impact Assessment (EIA) of this planning application will be undertaken by Cork County Council, as the competent authority.

Article 5 of the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU provides where an EIA is required, the developer shall prepare and submit an environmental impact assessment report (EIAR). The information to be provided by the developer shall include at least:

a) *a description of the project comprising information on the site, design, size and other relevant features of the project;*

b) *a description of the likely significant effects of the project on the environment;*
c) *a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
d) *a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;*
e) *a non-technical summary of the information referred to in points (a) to (d); and*
f) *any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.*

In addition, Article 94 of the Planning and Development Regulations 2001 (as amended) sets out the information to be contained in an EIAR, with which this EIAR complies.

MKO was appointed as environmental consultant on the Proposed Project and commissioned to prepare this EIAR in accordance with the requirements of the EIA Directive as amended by Directive 2014/52/EU.

Part 2 of Schedule 5 of the Planning and Development Regulations 2001, as amended, identifies classes and scales of development that require Environmental Impact Assessment (EIA). The relevant class of development in this case relates to "installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts", as per Item 3(i) of the Schedule. The Proposed Development exceeds 5 Megawatts in scale and proposes more than 5 turbines, and therefore is subject to EIA.

The Proposed Project seeks to extend the operational period of the existing Taurbeg Wind Farm, no changes to the existing wind farm infrastructure are proposed.

The EIAR provides information on the receiving environment and assesses the likely significant effects of the Proposed Project on it and proposes mitigation measures to avoid or reduce these effects. The function of the EIAR is to provide information to allow the competent authority to conduct the EIA of the Proposed Project.

All elements of the Proposed Project, including the wind turbines and associated infrastructure (substation, site access roads) have been assessed as part of this EIAR.

1.2.2 EIAR Guidance

The Environmental Protection Agency (EPA) published its 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, May 2022), which is intended to guide practitioners preparing an EIAR in line with the requirements set out in the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).

In preparing this EIAR regard has also been taken of the provisions of the 'Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment', published by the Department of Housing, Planning and Local Government (DHPLG) in August 2018 to the extent these guidelines are relevant having regard to the enactment of the revised EIA Directive.

The European Commission also published a number of guidance documents in December 2017 in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU as amended by 2014/52/EU) including 'Guidance on Screening', 'Guidance on Scoping' and 'Guidance on the preparation of the Environmental Impact Assessment Report'. MKO has prepared the EIAR with regard to these guidelines also.

1.2.3 Wind Energy Development Guidelines for Planning Authorities

The relevant considerations under the '*Wind Energy Development Guidelines for Planning Authorities'* (Department of the Environment, Heritage and Local Government (DOEHLG), 2006) have been taken into account during the preparation of this EIAR.

The '*Wind Energy Development Guidelines for Planning Authorities'* (DoEHLG, 2006) (hereafter referred to as the 2006 WEDGs) were the subject of a targeted review. The proposed changes to the assessment of impacts associated with onshore wind energy developments were outlined in the document Draft Wind Energy Development Guidelines (December 2019) (hereafter referred to as the draft 2019 WEDGs). A consultation process in relation to the draft 2019 WEDGs closed on 19th February 2020, however no update or final guidelines were released. The proposed changes presented in the draft 2019 WEDGs give certain focus on the setback distance from residential properties (four times the proposed maximum tip height), along with shadow flicker and noise requirements relative to sensitive receptors.

The Climate Action Plan (CAP25)[1] published in April 2025 states that new draft guidelines will be issued in 2024. At the time of submission of this application, there has been no public consultation or finalisation of new guidelines. The relevant guidelines for the purposes of section 28 of the Planning and Development Act 2000, as amended, remain to be the 2006 WEDGs.

1.3 The Applicant

The Applicant for the Proposed Project is Taurbeg Ltd, which is owned by Statkraft Ireland Ltd, a Norwegian company with Irish headquarters located in Cork. Statkraft is Europe's largest renewable energy producer, providing a range of renewable energy technologies such as onshore and offshore wind, solar, and grid services. Statkraft Ireland, which has already built approximately 500MW of wind, solar and battery projects across the country, recently announced plans to deliver 3GW of renewable energy projects in Ireland by 2030.

Statkraft Ireland has extensive experience in the design, construction and operation of wind energy developments in Ireland and has built projects in counties Kerry, Cavan and Offaly.

1.4 Brief Description of the Proposed Project

Planning permission is being sought for the extension of the operational life of Taurbeg Wind Farm (Proposed Lifetime Extension) as permitted by Cork County Council under planning regulation ref N/2002/3608, for a further period of 10 years from the date of expiry (2026) per Condition no. 7 of the original planning consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Lifetime Extension does not comprise any alterations to the existing operational wind farm. The Applicant intends to submit an application to Cork County Council for the Proposed Lifetime Extension.

The Proposed Lifetime Extension comprises:

i. *11 no. existing wind turbines with a tip height of 108.2 metres and all associated foundations and hardstanding areas;*

[1] *CAP 25 https://assets.gov.ie/static/documents/Climate_Action_Plan_2025_updated_cover.pdf*

ii. *1 no. existing onsite 38kV electrical substation including a control building, associated electrical plant and equipment, welfare facilities and a wastewater holding tank;*
iii. *1 no. existing meteorological mast with a height of 67m;*
iv. *All existing underground electrical and communications cabling connecting the existing wind turbines to the existing onsite 38kV Substation;*
v. *An existing gated site entrance and existing internal access tracks;*
vi. *Existing site drainage;*
vii. *Existing ancillary infrastructure, associated site fencing and signage.*

The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. A 38kV underground cable runs between the onsite substation and a mast at the south of the site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The grid connection does not form part of the current planning application.

The Proposed Lifetime Extension is expected to have significant negative effects on displacement of Hen Harrier. Proposed Offsetting Measures have been developed to offset these effects. The lands within which these measures are proposed are located c. 12km east of the Taurbeg Wind Farm Site in Co. Kerry. The Applicant intends to submit an application to Kerry County Council for the Proposed Offsetting Measures.

The Proposed Offsetting Measures comprise:

i. *Permanent removal of commercial forestry (deforestation) over an area of approx. 105.5 Ha and the restoration of open peatland and creation of scrub habitat within the felled area.*
ii. *Restoration of farmland habitat to good quality hen harrier foraging habitat through diversifying the range and extent of habitats over an area of approx. 17.7 Ha;*
iii. *All associated site development works including fencing.*

A full description of the Proposed Project for the purposes of the planning application and the additional elements that form part of the overall project, assessed in this EIAR, is outlined in Chapter 4 of this EIAR. Further details of the Proposed Offsetting Measures can also be found in Appendix 7-7 of the EIAR.

1.5 Policy and Regulatory Support

1.5.1 Council Regulation (EU) 2022/2577 and 2024/223

Arising from REPowerEU, Council Regulation (EU) 2022/2577 laying down a framework to accelerate the deployment of renewable energy was adopted on the 22 December 2022 and to apply for 18 months. Regulation 2022/2577 came into effect on the 23 December 2022 and had effect until the 30 June 2024. The Regulation made provision for a review by the commission within 12 months. Following this review the Council introduced Regulation 2024/223 on the 22 December 2023 amending Regulation 2022/2577 and extending the life of certain provisions of the Regulation beyond June 2024 to June 2025. Regulation 2022/2577 and 2024/223 recognises the relative importance of renewable energy deployment in the current difficult energy context and provides significant policy and legislative support to enabling renewable energy projects.

Certain provisions previously contained in the original Regulation (including the rebuttable presumption in favour of imperative reasons of overriding public interest (IROPI)) have now been placed on a permanent footing within REDIII and were required to be transposed by 1 July 2024.

Article 2(2) of Regulation (EU) 2022/2577 requires priority to be given to projects that are recognised as being of overriding public interest whenever the balancing of legal interests is required in individual cases and where those projects introduce additional compensation requirements for species protection.

An analogous provision is not present in Directive (EU) 2018/2001. The first sentence of Article 3(2) of Regulation (EU) 2022/2577 has the potential, in the current urgent and still unstable energy situation on the energy market which the Union is facing, to further accelerate renewable energy projects since it requires Member States to promote those renewable energy projects by giving them priority when dealing with different conflicting interests beyond environmental matters in the context of Member States' planning and the permit-granting process. The Commission's report demonstrated the value of the first sentence of Article 3(2) of Regulation (EU) 2022/2577 which beyond the specific objectives of the derogations foreseen in the Directives referred to in Article 3(1) of Regulation (EU) 2022/2577. (emphasis added).

1.5.2 Compliance with EU Policy

The Proposed Project is considered to be fully in accordance with and supported by the above-mentioned EU Policy targets. The Proposed Project is in line with the targets outlined in the 2030 Climate and Energy Framework. An EU wide binding target of 27% renewable energy by 2030 and a target of at least 27% energy efficiency by 2030 are both targets that can be achieved through the delivery of the Proposed Development and other similar projects. The target of increasing the binding target of the EU's energy mix from 32% to a minimum of 42.5% by 2030 is also considered to be a target that would be achievable by the construction of new renewable energy schemes and the continuation of existing operations such as the Proposed Project. Similarly, in the Energy Roadmap 2050 which considers scenarios which will lead to achieving the EU's climate action and energy goals. The Roadmap notes that all scenarios show the biggest share of energy supply technologies in 2050 comes from renewables. Therefore, it is submitted that the Proposed Project is in line with the EU Energy Roadmap.

Further detail is provided in Section 2.3.1 in Chapter 2 of this EIAR. As such, the Proposed Project, a renewable energy project, is critical to helping Ireland, and the EU in addressing energy security challenges as well as addressing the country's over-dependence on imported fossil fuels.

1.5.3 National Policy

In March 2019, the Joint Committee on Climate Action published *'A Cross Party Consensus for Action'* in which they encouraged the upgrading of existing onshore wind turbines where this will yield additional potential. While acknowledging that there are challenges in relation to securing additional on-shore wind generated renewable energy, this report fully supports the increased provision of on-shore wind farm development at appropriate locations (such as that of the current proposal) and acknowledged that on-shore wind has a pivotal role to play in achieving climate action targets.

The Programme for Government- Our Shared Future (updated in April 2021) places specific emphasis on climate change, stating that the next ten years are a critical period in addressing the climate crisis. It is an ambition of the programme to more than halve carbon emissions over the course of the decade (2020-2030). The programme notes that the government are committed to reducing greenhouse gas emissions by an average 7% per annum over the next decade in a push to achieve net zero emissions by the year 2050. The programme also recognises the severity of the climate challenge as it clarifies that "*climate change is the single greatest threat facing humanity*".

With regards to energy, the Programme notes that the government will implement a new National Energy Efficiency Action Plan to reduce energy use, including behavioural and awareness aspects of energy efficiency such as building and data management. Further, the government are also committed to the rapid decarbonisation of the energy sector, along with this is has noted that the necessary steps will be taken to deliver at least 80% of renewable electricity by the year 2030.

In 2022, Ireland's government introduced legally binding five-year carbon budgets and sectoral emissions ceilings. It also resolved a legislative framework with annually revised Climate Action Plans to

align with the country's 2030 net emissions reduction target of 51% (compared with 2018 levels) and net zero by 2050. The Climate Action Plan 2025 was launched in April 2025. Following on from Climate Action Plans 2023 and 2024, CAP 2025 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022 following the Climate Action and Low Carbon Development (Amendment) Act 2021, which commits Ireland to a *legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030.* CAP 2025 seeks to build on the progress made under Climate Action Plan 2024 by delivering policies, measurements and actions that will support the achievement of Irelands carbon budgets, SECs, and 2030 and 2050 climate targets.

A recent judgement of the High court delivered on 10th January 2025, provides clarity on the obligations imposed on public bodies under section 15 of the Climate Act (*Coolglass Wind Farm Limited v An Bord Pleanála [2025] IEHC 1*).

Mr Justice Humphreys undertook a detailed consideration of the interpretation of section 15 of the Climate Act and concluded that, when deciding upon an application relevant to the achievement of climate plans and objectives under S.15 of the 2015 Act, relevant bodies, in this case the Planning Authority, is required to:

1. Consider if the application, if granted, would contribute to achieving climate targets? In the case of renewable energy projects, the answer is invariably yes.
2. Consider whether granting permission is *"precluded by a mandatory and non-fixable legal requirement"* that does give the decision maker any flexibility in reaching an outcome favouring climate goals, i.e. a grant of permission.
3. If the decision maker is not precluded from granting permission, then how can the planning authority use its evaluative judgement and discretion to reach an outcome favouring policy goals.

As part of Mr Justice Humphrey's consideration of the interpretation of section 15 of the Climate Act, he states in his judgement that "*an immediate end to business as usual is a precondition for planetary survival"*.

1.6 Need for the Proposed Project

1.6.1 Overview

At EU level, in this era of both geopolitical turmoil and rapidly advancing climate change, decision makers are mandated to place renewable energy infrastructure in the overriding public interest over and above competing legal interests. This is evident within the terms of the Emergency Permitting Regulations[2], RED III[3] and the revised TEN-E Regulations[4] as well as within the EU Climate Law[5], the Irish Climate Action and Low Carbon Development Act (as amended) 2021, CAP23[6] and government policy regarding energy security[7].

[2] *Council Regulation (EU) 2022/2577 as amended by Council Regulation (EU) 2024/223*
[3] *Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652*
[4] *Regulation (EU) 2022/869 of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013 (2022) OJ L 152 (Revised TEN-E Regulation)*
[5] *Regulation (EU) 2021/1119 estbalishing a framework for achieving climate neutraility and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')*
[6] *The Climate Action Plan 2023 (CAP23) is the second annual update to Ireland's Climate Action Plan 2019. CAP24 was approved in December 2023 subject to SEA and AA*
[7] *November 2023, 'Energy Security in Ireland to 2030', Department of the Environment, Climate and Communications (DECC).*

Both Ireland and the EU have highly challenging, legally binding targets in place for increased renewable energy share (RES), which have increased rapidly in recent years. These high RES targets now in place are reflective of the fact that in a time of climate breakdown, when reduction of carbon in the atmosphere through provision of alternatives to carbon emitting activities must be prioritised, climate mitigation constitutes a key form of environmental protection.

In July 2021, the Climate Action and Low Carbon Development (Amendment) Act 2021 was signed into law, committing Ireland to reach a legally binding target of net-zero emissions no later than 2050, and a cut of 51% by 2030 (compared to 2018 levels). On this pathway to decarbonisation, the Government published the Climate Action Plan 2025 announcing a renewable electricity target of 80% by 2030, without compromising security of energy supply. The Proposed Project is seeking an extension to the operational life of the existing wind farm until 2036 and would therefore contribute to this 2030 target. In July 2024, the EPA published 'Ireland's Provisional Greenhouse Gas Emissions 1990-2023[8] which stated a provisional total of national greenhouse gas emissions (excluding Land Use, Land Use Change and Forestry (LULUCF)) for 2023 to be 55.01 million tonnes carbon dioxide equivalent (MtCO2eq) which is 6.8% lower (or 5.75 MtCO2eq) than emissions in 2022 (60.75 MtCO2eq). Ireland's 2023 emissions are below the 1990 baseline for the first time in three decades.

In 2023, the energy industries, transport and agriculture sectors accounted for 73.5% of total greenhouse gas (GHG) emissions. Agriculture is the single largest contributor to the overall emissions, at 37.8%. Transport, energy industries and manufacturing and industry sector are the next largest contributors, at 21.4%, 14.3% and 11.4%, respectively. The report further states that there was a substantial reduction in coal, oil and natural gas used in electricity generation (-44.2%, -78.2% and -7.2% respectively) which resulted in an annual reduction of 18.7% in total fuel used for electricity generation. Renewable energy usage increased from 39% in 2022 to 40.7% in 2023. The report highlights that whilst emissions are beginning to reduce, transformative measures will be needed to meet National Climate ambitions.

As such, the Proposed Project is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels. The need for the Proposed Project is driven by the following factors:

i. *A legal commitment from Ireland to limit greenhouse gas emissions under the Kyoto protocol to reduce global warming;*
ii. *A requirement to increase Ireland's national energy security as set out in Ireland's Transition to a Low Carbon Energy Future 2015-2030;*
iii. *A requirement to diversify Ireland's energy sources, with a view to achievement of national renewable energy targets and an avoidance of significant fines from the EU (the EU Renewables Directive);*
iv. *Climate Action Plan 2025 which aims to ensure that Ireland achieves its legally binding target (the Climate Action and Low Carbon Development (Amendment) Act 2021) of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030;*
v. *Increasing energy price stability in Ireland through reducing an over reliance on imported fossil fuels;*
vi. *Provision of cost-effective power production for Ireland which would deliver local benefits; and*
vii. *To facilitate the Government in meeting its ambitious 80% renewable energy target by 2030*

These factors are addressed in further detail below. Section 2.1 in Chapter 2 of this EIAR on Background to the Proposed Project, presents a full description of the international and national renewable energy policy context for the Proposed Project. Section 2.2 addresses climate change, including Ireland's current status with regard to meeting greenhouse gas emission reduction targets.

[8] *https://www.epa.ie/publications/monitoring–assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2023.php*

In March 2024, the World Meteorological Organisation (WMO) published the State of the Global Climate 2023 Report.[9] The report provides a summary on the state of the climate indicators in 2023 with sections on key climate indicators, extreme events and impacts. The key messages in the report include:

- 2023 was the warmest year on record at 1.45 ± 0.12 °C above the pre-industrial average.
- Concentrations of the three main greenhouse gases – carbon dioxide, methane, and nitrous oxide – reached record high observed levels.
- Antarctic sea-ice extent reached an absolute record low in February. The annual maximum extent was around 1 million km2 below the previous record low maximum.
- Extreme weather continued to lead to severe socio-economic impacts. Extreme heat affected many parts of the world. Wildfires in Hawaii, Canada and Europe led to loss of life, the destruction of homes and large-scale air pollution.
- Food security, population displacement and impacts on vulnerable populations continue to be of mounting concern in 2023, with weather and climate hazards exacerbating the situation in many parts of the world.

The State of the Global Climate 2023 report goes on to state that renewable energy generation, primarily driven by the dynamic forces of solar radiation, wind and the water cycle, has surged to the forefront of climate action for its potential to achieve decarbonization targets. There has been a substantial worldwide energy transition, with renewable capacity additions increasing by nearly 50% from 2022, totalling 510 gigawatts (GW).[10] This growth represents the highest rate observed in the past two decades, signalling a significant momentum toward achieving the clean energy goal set at the United Nations Framework Convention on Climate Change (UNFCCC) 28th Conference of the Parties (COP28) meeting in 2023 to triple renewable energy capacity globally to 11,000 GW by 2030.

The recent joint publication of WMO and International Renewable Energy Agency on Climate-driven Global Renewable Energy Potential Resources and Energy Demand in 2022[11] underscores the inherent links between renewable energy resources and weather and climate conditions. It calls for better integration of climate variability considerations into energy resource operation, management, and planning to enhance effectiveness and sustainability in these regions.

In June 2024, Wind Energy Ireland published the Repowering Ireland - How we Stay Global Leaders in Onshore Wind Energy Report [12]. The report highlights that despite the emphasis on developing new wind farms to meet the binding renewable energy and climate action targets for 2030 and beyond to 2050, there has been no comprehensive industry-wide analysis assessing the potential loss of currently installed wind energy generating capacity from the Irish electricity system. The report found that of the 4,347 MW of wind farms connected by Q3 2023, 854 MW will have to be decommissioned by 2030 and 2,488 MW by 2040, unless they are repowered or their operational life is extended.

The report also highlights the particular challenges associated with the repowering or extension of operation life of operational wind farm projects in Special Protection Areas (SPAs) designated for the protection of hen harrier under the EU Birds Directive. This is particularly relevant given the research established that there is 732MW of wind energy generating capacity currently installed within the hen harrier SPAs, and a further 347MW installed within five kilometres of these same SPAs. The report also suggests a strategy for repowering or extending the operational life of wind farms in SPAs for hen

[9] *World Meteorological Organisation (2024) State of the Global Climate 2023 <https://library.wmo.int/records/item/68835-state-of-the-global-climate-2023>*
[10] *IEA (2024), Renewables 2023, IEA, Paris <https://www.iea.org/reports/renewables-2023>*
[11] *International Renewable Energy Agency + WMO (2023) 2022 Year in Review: Climate-driven Global Renewable Energy Potential Resources and Energy Demand <https://www.irena.org/Publications/2023/Dec/2022-Year-in-Review-Climate-driven-Global-Renewable-Energy-Potential-Resources-and-Energy-Demand>*
[12] *WEI Repowering Ireland Report final-repowering-ireland-report-june-2024.pdf*

harrier, which involves assessing the impacts on the conservation objectives of the SPAs, and exploring the possibility of proceeding through the Imperative Reasons of Overriding Public Interest (IROPI) route, drawing on the recent EU policies that classify renewable energy projects as being in the overriding public interest

1.6.2 RePowerEU

In a Communication from the European Parliament on Joint European Action for more affordable, secure and sustainable energy[9], the European Commission proposed an outline of a plan to make Europe independent from Russian fossil fuels well before 2030 in light of Russia's invasion of Ukraine. Commission President Ursula von der Leyen stated:

"We must become independent from Russian oil, coal and gas. We simply cannot rely on a supplier who explicitly threatens us. We need to act now to mitigate the impact of rising energy prices, diversify our gas supply for next winter and accelerate the clean energy transition. The quicker we switch to renewables and hydrogen, combined with more energy efficiency, the quicker we will be truly independent and master our energy system."

In May 2022, the EU published the REPowerEU Plan[13] in light of Russia's invasion of Ukraine in February 2022. The core purpose of the plan, in addition to accelerating the EU's transition from the use of fossil fuel to renewable energy sources, is to end the dependence on Russian fossil fuels.

In April 2022, the Government published the National Energy Security Framework (NESF) providing a single overarching and initial response to address Ireland's energy security needs in the context of the war in Ukraine. This framework mirrors that of the EU, in which accelerating Ireland's transition from the use of fossil fuel to renewable energy sources is a key objective.

1.6.3 EU 2020 Renewable Energy Targets

The burning of fossil fuels for energy creates greenhouse gases, which contribute significantly to climate change. These and other emissions also create acid rain and air pollution. Sources of renewable energy that are utilised locally with minimal impact on the environment are necessary to meet the challenges of the future. The EU adopted the Renewable Energy Directive (2018/2001 EU) on the Promotion of the Use of Energy from Renewable Sources in December 2018 which sets EU 2030 Renewable Energy Targets.

The Directive sets a legally binding mandatory national target for the overall share of energy from renewable sources for each Member State. This package is designed to achieve the EU's overall 20:20:20 environmental target, which consists of a 20% reduction in greenhouse gases, a 20% share of renewable energy in the EU's total energy consumption and a 20% increase in energy efficiency by 2020. To ensure that the mandatory national targets are achieved, Member States must follow an indicative trajectory towards the achievement of their target as outlined in Ireland's National Renewable Energy Action Plan (NREAP).

The first Renewable Energy Directive (RED)[14] is legislation that influenced the growth of renewable energy in the EU and Ireland for the decade ending in 2020. From 2021, RED was replaced by the second Renewable Energy Directive (REDII)[15] which continues to promote the growth of renewable energy out to 2030. Given the transposition deadline for REDII has now passed, the provisions of REDII are now binding on the State and public authorities, including local authorities and An Bord

[13] *https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131*
[14] *Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Available from: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF*
[15] *Directive (EU) 2018/2001 on the promotion of the use of energy from renewable resources (recast). Available from: https://eurlex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L2001*

Pleanála. Ireland's mandatory national target for 2020 was to supply 16% of its overall energy needs from renewable sources. This target covered energy in the form of electricity (RES-E), heat (RES-H) and transport fuels (RES-T). Ireland fell just short of this target with the total renewable share of gross final consumption (GFC) reaching 13.5%. REDII introduced a binding EU-wide target for overall RES of 32% in 2030 and requires Member States to set their national contributions to the EU-wide target. As per the National Energy and Climate Plan (NECP) 2021-2030, Ireland's overall RES target is 34.1% in 2030.

Under RED, the RES-E target was for 40% of gross electricity consumption to come from renewable sources in 2020 The actual RES-E achieved in 2020 by Ireland was 39.1%, falling just short of the national target. Under REDII, Ireland's National Energy and Climate Plan 2021-2030 included a planned RES-E of 70% in 2030, which has been replaced by the 80% by 2030 RES-E target as detailed in the more recent Climate Action Plan (2025), which will ensure that renewable electricity continues to form the backbone of Irish renewable energy use for the coming decade and beyond. Repowering is defined in REDII as "renewing power plants that produce renewable energy, including the full or partial replacement of installations or operation systems and equipment for the purposes of replacing capacity or increasing the efficiency or capacity of the installation". It is considered that this definition captures this Lifetime Extension application.

1.6.4 EU 2030 Renewable Energy Targets

The Climate Action and Low Carbon Development (Amendment) Act 2021 commits Ireland to reach a legally binding target of net-zero emissions no later than 2050, and a cut of 51% by 2030 (compared to 2018 levels). Under the 2021 Act, Ireland's national climate objective requires the state to pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy.

Ireland's statutory national climate objective and 2030 targets are aligned with Ireland's obligations under the Paris Agreement and with the European Union's objective to reduce GHG emissions by at least 55% by 2030, compared to 1990 levels and to achieve climate neutrality in the European Union by 2050.

Given the need to ratchet up the EUs clean energy transition, RED was revised in 2023, and the amending Directive EU/2023/2413 (REDIII)[16] entered into force on 20 November 2023. REDIII amended the EU-wide overall 2030 RES target from 32% to at least 42.5%, and it is assumed that Irelands 2030 RES target will increase accordingly. Certain provisions previously contained in the original Regulation (including the rebuttable presumption in favour of IROPI) have now been placed on a permanent footing within REDIII and were required to be transposed by 1 July 2024.

Article 16f puts the presumption of 'IROPI' on a permanent footing. It states that by 21 February 2024 and until climate neutrality is achieved, Member States shall ensure that in the permit granting procedure, the planning, construction and operation of renewable energy plants are presumed as being in the overriding public interest and serving public health and safety when balancing legal interests for the purposes of the Habitats Directive, the Water Framework Directive and the Birds Directive. It states that Member States may in duly justified and specific circumstances restrict the application of this provision to certain parts of their territory or to certain types of technology etc in accordance with their national energy/climate plans. However, Member States are obliged to inform the Commission of any such restrictions and provide reasons for same.

[16] *Directive (EU) 2023/2413 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413*

In April 2025, the Government published the most recent Climate Action Plan 2025, announcing a renewable electricity target of 80% by 2030 for Ireland. This is in line with the previous target of 80% by 2030, as announced in the Climate Action Plan 2024.

The Climate Action Plan 2025 states that in order to meet the required level of emissions reduction by 2030 and the 80% renewable electricity generation target by 2030, the installed generation capacity of onshore wind will need to reach 9GW and at least 5GW of offshore wind. The SEAI provides a provisional estimate of installed wind energy capacity in 2024 based on EirGrid data to the end of August and ESBN data to the end of September; the provisional value of installed wind capacity in Ireland is 4.85GW.[17] As of January 2025, there was 6.3GW of wind energy capacity installed on the island of Ireland; Of this, 4.9GW was installed in the Republic of Ireland.[18] As noted previously, Ireland missed it's 2020 renewable energy target of 40% with a renewable share in electricity of 39.1%, and by the end of 2021, Irelands renewable energy share for electricity generation was 32.5%. With a renewable share of electricity generation at 80% in mind and a target of 9GW installed onshore wind by 2030, it is now more critical than ever that we continue to progress renewable energy development in Ireland so that we are successful in meeting our 2030 targets. Further detail on the EU 2030 targets is noted in Chapter 2.

1.6.5 Climate Change and Greenhouse Gas Emissions

At the Paris climate conference (COP21) in December 2015, 195 countries adopted the first-ever universal, legally binding global climate deal. The agreement sets out a global action plan to avoid dangerous climate change by limiting global warming to well below 2°C above pre-industrial levels. Under the agreement, Governments also agreed on the need for global emissions to peak as soon as possible, recognising that this will take longer for developing countries and to undertake rapid reductions thereafter in accordance with the best available science. The Sharm el- Sheikh climate conference (COP28) in December 2023 in Dubai resulted in the first agreement explicitly calling for the transition away from fossil fuels, the United Arab Emirates (UAE) Consensus. This text raised concerns over the achievement of limiting warming below 1.5°C, as the text to 'phase out as soon as possible inefficient fossil fuel subsidies' did not address energy poverty or the just transition. The UAE Consensus further called for more explicit near-term goals in the lead up to 2050, calling for the world to cut greenhouse gas emissions by 43% as compared to 2019 levels. The most recent climate conference (COP29) took place in Azerbaijan in November 2024 and focused on accelerating global efforts to address climate change, in particular global efforts related to climate finance. The New Collective Quantified Goal on Climate Finance (NCQG) was agreed in the final days of COP29 with developed nations agreeing to triple finance to developing countries, with commitments increasing from USD 100 billion annually to USD 300 billion annually by 2035. Significant progress was made in the discussions surrounding carbon markets, with nearly 200 nations agreeing on critical rules under Article 6 of the Paris Agreement. The adoption of these rules is seen as a crucial step towards operationalising a robust and credible carbon market.

The International Panel on Climate Change (IPCC) put forward its clear assessment in their Fifth Assessment Report[19], that the window for action on climate change is rapidly closing and that renewable energy sources such as wind will have to grow from 30% of global electricity at present to 80% by 2050 if we are to limit global warming to below 2 degrees and in accordance with the COP 21 agreement to limit global warming to well below 2°C above pre-industrial levels. Former Minister Kelly remarked in 2015 that "*As a nation we must do everything in our power to curb our emissions".*

[17] *SEAI Energy in Ireland 2024. Available at: https://www.seai.ie/sites/default/files/publications/energy-in-ireland-2024.pdf*
[18] *EirGrid,* https://www.eirgrid.ie/grid/system-and-renewable-data-reports
[19] IPCC Fifth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR5 Report

In February 2022, the International Panel on Climate Change (IPCC) released the report 'Working Group II-Climate Change 2022: Impacts, Adaptation and Vulnerability' regarding the impacts of climate change on nature and human activity. The report states that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades. the report identifies four key risks for Europe with most becoming more severe at 2°C global warming levels (GWL) compared with 1.5°C GWL. From 3°C GWL, severe risks remain for many sectors in Europe. The four key risks identified are:

- Key Risk 1: Mortality and morbidity of people and changes in ecosystems due to heat;
- Key Risk 2: Heat and drought stress on crops;
- Key Risk 3: Water scarcity;
- Key Risk 4: Flooding and sea level rise

In April 2022, the IPCC released the report 'Working Group-III – Climate Change 2022: Mitigation Of Climate Change', which assesses literature on the scientific, technological, environmental, economic and social aspects of mitigation of climate change. The report reflects new findings in the relevant literature and builds on previous IPCC reports, including the WGIII contribution to the IPCC's Fifth Assessment Report (AR5), the WGI and WGII contributions to Sixth Assessment Report (AR6) and the three Special Reports[20] in the Sixth Assessment cycle. This report outlines developments in emission reduction and mitigation efforts, assessing the impact of national climate pledges in relation to long-term emissions goals in a global context.; and states that '*Unless there are immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C will be beyond reach.*'

In November 2023, the IPCC published the '*AR6 Synthesis Report: Climate Change 2023*'[21], and is the final product of the AR6 of the IPCC. It summarises the state of knowledge of climate change, its widespread impacts and risks, and climate change mitigation and adaptation. It confirms that the unsustainable and unequal energy and land use as well as historical use of fossil fuels have unequivocally caused global warming, with global temperatures approximately 1.1°C above 1850-1900 levels. A substantial 'emissions gap' exists between global greenhouse gas emissions in 2030 associated with the implementation of NDCs announced prior to COP26, Parties to the Paris Agreement have two years to submit updated NDCs for the period up to 2035, ambition will need to be ratchetted up in order to limit warming to 1.5°C.

In May 2024, the EPA published the *'Ireland's Greenhouse Gas Emissions Projections 2023-2050'*[22] . Under the With Existing Measures (WEM) scenario, emissions from the energy industries sector are projected to decrease by 57% from 10.1 to 4.4 Mt CO2 eq over the period 2022 to 2030. Under the With Additional Measures (WAM) scenario, emissions from the energy industries sector are projected to decrease by 62% from 10.1 to 3.9 Mt CO2 eq over the period 2022 to 2030.

The '*National Energy Projections 2024*'[23], published annually by the Sustainable Energy Authority of Ireland (SEAI), state that in 2023, 87% of all energy used in Ireland was from fossil fuels, 12% from renewable sources and the remainder from others such as waste and electricity imports. In order to achieve Ireland's national climate objective, virtually all fossil fuel for energy use will need to be

[20] *The three Special Reports are: Global Warming of 1.5°C: an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (2018); Climate Change and Land: an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (2019); IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (2019)*
[21] *IPCC Sixth Assessment Synthesis Report, Intergovernmental Panel on Climate Change AR6 Report: Climate Change 2023*
[22] *Ireland's Greenhouse Gas Emission Projections 2023-2050 https://www.epa.ie/publications/monitoring–assessment/climate-change/air-emissions/EPA-GHG-Projections-Report-2022-2050-May24–v2.pdf*
[23] *SEAI National Energy Projections 2024 Report. < https://www.seai.ie/sites/default/files/publications/National-Energy-Projections-Report-2024.pdf >*

eliminated before 2050. By 2030, fossil fuels will still likely provide most of Ireland's energy, ranging from 70% in the WEM scenario to 62% in the WAM scenario.

The deployment of renewables needs to outpace the growth of energy demand for the absolute reductions in greenhouse gas emissions that are required to be met. However, in the modelled scenarios, the electricity sector exceeds the sectoral emissions ceilings for the second carbon budget period. In the second budget period, the exceedance is projected to be 6.8 $MtCO_2eq$ (11%) and 5.2 $MtCO_2eq$ (9%) in the WEM and WAM scenarios respectively.

The existing Taurbeg Wind Farm has a generating capacity of 25.3MW. On this basis, the Proposed Lifetime Extension will result in the net displacement of approximately 18,852 tonnes of carbon dioxide (CO_2) per annum, including accounting for back-up generation. The carbon offsets resulting from the Proposed Project are described in detail in Section 11.5 of Chapter 11: Climate of this EIAR.

1.6.6 Energy Security

At a national level, Ireland currently has one of the highest external dependencies on imported sources. In November 2023 the Department of the Environment, Climate and Communications (DECC) released '*Energy Security in Ireland to 2030*'[24] which states that 'Irelands future energy will be secure by moving from an oil-, peat-, coal, and gas-based energy system to an electricity-led system, maximising our renewable energy potential flexibility and being integrated in Europe's energy systems. This report proposes a package of a wide range of measures to implement to 2030 to improve Irelands energy security. Ireland is currently one of the most energy import dependent countries in the EU, having imported 77% of its energy supply in 2021 and 82% in 2022.[25] The '*Energy Security in Ireland to 2030*' provides a roadmap to energy security in Ireland, on the basis of current energy policies and project and to implement the measures proposed as part of the energy security package. EirGrid in their '*All Island Generation Capacity Statement 2022 - 2031*'[26](January 2024), states that installed capacity of wind generation has increased from 135 MW at the end of 2002 to 4.5 GW at the end of 2022. This value is expected to increase to 7 GW of onshore wind and at least 5 GW of offshore capacity by 2030. In a recent Wind Energy Ireland presentation in June 2024, installed wind capacity has increased to 4,767MW.

Prior to 2015, Irelands import dependency of energy was over 90% but dropped to 71% in 2016 with the Corrib gas field starting production. Since 2018, Ireland's import dependency has been increasing as the output from the Corrib gas field reduces faster than we are adding new renewable sources.

In January 2024 the SEAI published their '*Energy in Ireland 2023 Report*'[27], stating that in 2022, 49.2% of the electricity generated indigenously in Ireland came from gas, with renewables accounting for a further 38.9%. Coal, oil, non-renewable wastes (NRW), and peat accounted for the remainder of electricity generation in Ireland. The overall renewable energy share for gross final energy consumption for 2022 was 13.1%. 2022 had the lowest energy-related emissions of any year in the last quarter century, except for 2020 which was heavily influence by the COVID-19 lockdowns. The SEAI Energy in Ireland 2023 report, using early provisional data from January to September 2023, states that electricity emissions may be significantly reduced from 2022 levels in 2023 and the carbon intensity of the national

[24] *Department of the Environment, Climate and Communications (2023) Energy Security in Ireland to 2030. <https://assets.gov.ie/276471/2d15ce6d-e555-4ada-a3cf-b325a5d7ba20.pdf>*
[25] *Sustainable Energy Authority of Ireland (2023) Key insights from SEAIs 2022 National Energy Balance. <https://www.seai.ie/data-and-insights/seai-statistics/key-publications/national-energy-balance/Key-Insights-from-2022-National-Energy-Balance.pdf>*
[26] *https://cms.eirgrid.ie/sites/default/files/publications/19035-EirGrid-Generation-Capacity-Statement-Combined-2023-V5-Jan-2024.pdf*
[27] *Sustainable Energy Authority Ireland (2024) Energy in Ireland – 2023 Report*

grid may be down to 259 gCO2/kWh, which, if achieved, will be the lowest carbon intensity value ever reached in Ireland.

Ireland continues to be hugely energy import-dependent leaving it exposed to large energy price fluctuations as a minimum and possibility of fuel shortages if a major energy crisis were to occur. The international fossil fuel market is growing increasingly expensive and is increasingly affected by international politics which can add to price fluctuations. This volatility will be increased as carbon prices increase in the future. This has implications for every Irish citizen.

The SEAI has stated that Irelands heavy dependence on imported fossil fuels, *"is a lost opportunity in terms of keeping this money here in Ireland and further developing our abundant renewable resources"*[28].

The cost of carbon credits is included in all electricity traded, and the price of electricity generated by coal is particularly vulnerable due to its high carbon emissions per unit of electricity generated. Coal and peat generate almost 5% of Ireland's electricity, while gas generates 51%. At a time when the energy system is under severe pressure to ensure security of supply, amid projections of rapid electricity demand growth over the coming decade, any steps to reduce Ireland's dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. The use of Ireland's indigenous energy resources, such as wind, will contribute to a reduction in energy imports.

The Energy White Paper 2015[29] ('the White Paper) notes "There will be a substantial increase in the cost of carbon in the short and medium term, through the EU Emissions Trading Scheme". Any steps to reduce dependence on imported fossil fuels will add to financial autonomy and stability in Ireland. As the White Paper notes:

> *"In the longer term, fossil fuels will be largely replaced by renewable sources".*

1.6.7 Competitiveness of Wind Energy

While Ireland has a range of renewable resources, as the Energy White Paper 2015 [9]states "[Onshore Wind] *is a proven technology and Ireland's abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support*".

In fact, the cost of support is more than offset by the fact that adding large quantities of wind to the wholesale market drives down auction prices in any half hour trading period when the wind is blowing, i.e. for 80% of the hours of the year. Wind has a capacity factor of approx. 35%, which is its average output throughout the year relative to its maximum output. However, wind is generating power at some level for 80% of the hours of the year. A Pöyry study from 2015 showed that reaching our targets in 2020 would reduce wholesale prices by more than costs of new grid infrastructure, backup and the subsidies paid to wind, resulting in a net saving of €43m per year in 2020. The EU has noted that Ireland has one of the lowest costs of supporting renewables mainly because onshore wind is on a par with the cost of power from conventional generation when a full cost-benefit analysis is undertaken.

1.6.8 Increasing Energy Consumption

As detailed above, the Climate Action Plan 2025 identifies a need for 9GW of onshore wind generation in order for Ireland to meet its 2030 targets. In their '*All Island Generation Capacity Statement 2022 - 2031'* (October 2022), EirGrid estimate that installed capacity of wind generation is set to increase to at

[28] *Dr Eimear Cotter, Head of Low Carbon Technologies, SEAI - "Energy Security in Ireland 2015"*
[29] *Ireland's Transition to a Low Carbon Energy Future 2015-2030 (Department of Communications, Energy & Natural Resources, 2015)*

least 12 GW between onshore and offshore capacity as Ireland endeavours to meet its renewable targets in 2030 and beyond.

Failure to meet Ireland's targets for renewable energy will result in substantial EU sanctions. The Department of Public Expenditure and Reform (DPER) in their report 'Future Expenditure Risks associated with Climate Change/Climate Finance' concluded that *'potential costs of purchasing non-Emission Trading Scheme (ETS) GHG compliance for the Irish Exchequer for the 2020 to 2030 period could have a cumulative total in the billions in the absence of any further policy changes'*. If Ireland decided to backfill shortfalls in the RES-H target with additional renewable electricity this could significantly reduce these costs.

In April 2016[30] the SEAI estimated the historic build rate for wind energy deployment as 180 MW per year since 2005. If this average build rate over the remaining period between 2018 and 2020 is assumed, then approximately 3.85 GW of wind would be built up to 2020. The SEAI has provided a provisional estimate of wind capacity in Ireland in 2023 to be 4.59GW.[31]

It is noted that the key driver for electricity demand in Ireland for the next number of years is the connection of large new energy users, such as data centres. This statement notes that '*Large industrial connections normally do not dominate a country's energy demand forecast but this is the case for Ireland at the moment*'. EirGrid analysis shows that demand from data centres could account for 28% of all demand by 2031 in a median demand scenario (accounts for the connection of all 1400MVA of potential demand in the connection process). The median demand scenario is now higher than for last year's forecast for high demand, indicating the progression of many of the data centre projects.

In 2015, IWEA commissioned a study '*Data Centre Implications for Energy Use in Ireland'* which concluded that an extra approx. 1 Gigawatt (GW) of electricity demand could materialise between 2015 and 2020 due to growth in data centres. More recently, data available from Bitpower[32] as of June 2023 noted a total of 82 operational data centres with a combined total of 1,261 MW of connected power capacity. A further 40 data centres have secured planning permission which will have a total power capacity of 1,286MW, with 14 data centres being under construction which will have a total of 356MW of power capacity. The increase in growth of data centres means an increase in electricity demand, with many of the proposed data centres committing to using 100% renewable energy which will result in an increased demand for renewable electricity as detailed above.

In the context of increasing energy demand and prices, uncertainty in energy supply and the effects of climate change, our ability to harness renewable energy such as wind power plays a critical role in creating a sustainable future. The DECC have set a target for Ireland of 80% of total electricity consumption to come from renewable resources by 2030, this target forms part of the Government's strategy to make the green economy a core component of its economic recovery plan for Ireland. It is envisaged that wind energy will provide the largest source of renewable energy in achieving this target, with a target of 9GW onshore wind installed generation capacity and a target of 5GW offshore wind installed generation capacity.

The Department of Communications, Energy & Natural Resources (DCENR) noted in their Draft Bioenergy Plan 2014, that achieving the anticipated renewable energy usage in the three energy sectors will be challenging, with the 12% for renewable heat being particularly so. SEAI estimate that the shortfall could be in the region of 2% to 4% of the 12% RES-H target. Given that individual member states 2030 targets are set at a more challenging level than 2020, fines could persist for an extended number of years, and so the total cost to Ireland could run to billions. For comparison, the entire wholesale electricity market has an annual value of around €3bn.

[30] *https://www.seai.ie/publications/Ireland___s-Energy-Targets-Progress-Ambition-and-Impacts.pdf*
[31] *Sustainable Energy Authority of Ireland (2024) Energy in Ireland – 2023 Report*
[32] *https://www.bitpower.ie/index.php/dashboard*

In the medium-term, with the introduction of electric vehicles and uptake of smart demand such as storage heating and heat pumps, emissions in the heat and transport sector will be substantially reduced. A high renewables electricity system is the foundation of such a transformation.

The White Paper published by DCENR in December 2015 expanded on the vision set out above. It outlines a radical transition to a low carbon future which will involve amongst other things, *'generating our electricity from renewable sources of which we have a plentiful indigenous supply'* and *'Increasing our use of electricity and biogas to heat our homes and fuel our transport'*.

The DCENR confirmed in the publication of the White Paper '*Ireland's Transition to a Low Carbon Future' 2015 – 2030*, that wind is the cheapest form of renewable energy:

> *"(Onshore wind) is a proven technology and Ireland's abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support."*

EU countries have agreed on a new 2030 Framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target. It is noted that a binding EU target of 32% for renewable energy by 2030 has been set by the EU 2030 Framework for Climate and Energy, with Ireland confirming its own targets for 2030 as detailed below.

Ireland will therefore have to meet even more demanding climate change and renewable energy supply obligations in order to play its part in achieving the European climate and energy ambitions. As announced in December 2022, the Irish Government have pledged to generate 80% of the country's electricity supply from renewable sources by 2030. The development of additional indigenous wind energy generating capacity, such as that proposed at the Proposed Wind Farm, will not only help to reduce carbon emissions but will also improve Ireland's security of energy supply. Such penetration levels of wind are technically and economically feasible once paired with other energy system changes such as increasing electric vehicle penetration and electrification of heat. Further information on the 2030 commitments for Ireland are noted in Chapter 2, Section 2.2.

These sources of 'flexible demand' allow the system to match intermittent renewable energy resources with minimal extra cost. Additional interconnection is also planned with the UK and France, further assisting in the integration of wind (and in the future solar) on the power system.

A number of alternative energy types have been examined when considering how best to meet this renewable energy target.

In 2014, a report prepared by UK consultant BW Energy for the Rethink Pylons campaign group has suggested that converting Moneypoint generation station (which runs solely on coal) from coal to biomass would have enabled Ireland to meet 2020 renewable energy targets. Dr Brian Motherway, Chief Executive SEAI[33] refutes this claim. While Dr Motherway agrees that biomass offers benefits and is helping Ireland to move away from fossil fuels, he states that "*the conversion of Moneypoint to biomass has been considered a number of times over the years, including actual trials of small amounts of biomass in the station. However, the technical and economic challenges have proven far greater than some would have us believe*".

The reason being that the move of Moneypoint from coal to biomass would not entail a clean swap. In fact, '*to allow for combustion of biomass, a full redesign and rebuild of much of the station would be required*'. In the UK where this has been done, energy generation stations have required significant financial support to make the process viable and with each unit of energy in the UK being worth

[33] *http://www.seai.ie/News_Events/Press_Releases/2014/Biomass-is-a-big-part-of-the-solution-but-not-the-whole-solution.html*

approx. 13 cents, almost double that of Ireland which is approx. 7 cents, wind energy works out cheaper in Ireland. Also, the amount of biomass required to feed Moneypoint would require 300,000ha of land; an equivalent area of Counties Wexford and Carlow being planted with willow which is far more than Ireland currently produces which means we would need to import.

Importation raises the question; would this be cost effective? As prices are volatile and availability of biomass is difficult to predict Ireland would become dependent on the uncertainty of imported biomass. It is also noted that there will be emissions from transport and distribution. The further the biomass is transported, the greater the greenhouse gas emissions[34]. So, while biomass is currently contributing to a move to renewable energy production, on its own it is not the sole answer to meeting Ireland's renewable energy targets. Ireland has a legal obligation to diversify its energy sources requiring the development of renewable energy to avoid substantial fines.

The Joint Committee on Climate Action published its cross-party report entitled, '*Climate Change: A Cross- Party Consensus for Action'* (March 2019). This report highlights the requirements for alternate energy production. More specifically, the report notes that it is currently planned to stop burning coal at Moneypoint by 2025 as well as peat at Bord na Mona and ESB stations by 2030. In April 2025, the DECC published CAP25 which is the fourth annual update to Irelands Climate Action Plan 2019 and the third to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021. CAP25 notes the need for renewable alternatives to coal and peat. Further information on the CAP25 can be seen in Chapter 2.

CAP25 states that as electrification and decarbonisation of other sectors continues, there will be an increase in electricity demand, and a transferring of emissions from those sectors to the electricity sector. The deployment of renewables needs to outpace the growth in energy demand for it to deliver the absolute reductions in greenhouse gas emissions required. Therefore, the timing of the delivery of the renewable energy generation relative to the scale and pace of growth in electricity demand is a critical factor. In the high demand scenario outlined in the Programme for Government, electricity demand will almost double by 2030, while electricity emissions are to be reduced by 60-80% at the same time.

Underlying drivers of changes in electricity demand include:

- Data centres are forecast to continue to grow by up to ~9 TWh in 2030 (~2316% of total demand)
- Transport electricity demand is forecast to grow (~23% p.a.) as a result of fast uptake of EV charging
- Electrical heating in industry will increase by more than 2.5 times in 2030 from 2017 levels
- Building energy efficiency improvements from an extensive retrofit programme will moderate the growth in electricity demand from new heat pumps in buildings

Against this backdrop, the importance of wind energy as the main component of Ireland's renewable energy development is acknowledged, and wind energy is accepted as the main contributor to meeting the Country's national climate change and energy supply obligations. Notwithstanding this, it must also be acknowledged that not every part of Ireland is well endowed with wind resources and therefore, not all counties will be able to deliver wind-based renewable energy. Furthermore, whilst it is accepted that there are other renewable energy technologies in operation, for the foreseeable future many areas will be unable to deliver significant renewable energy output. This primarily applies to the more populous areas.

National and international renewable energy and climate change targets must be achieved, and it is crucial that these are appropriately translated and implemented at regional and local levels. Wind farm

[34] *Sustainability Criteria Options and Impacts for Irish Bioenergy Resources (SEAI 2019)*

development and design involves balancing the sometimes-conflicting interests of constraints (e.g., natural and built heritage, human beings, ecological, ground conditions, hydrological, etc.) with visual amenity and the technological/economic requirements/realities of the specific project and turbines. As detailed in Section 1.5.2.2 above, EU Regulation 2022/2577 as amended by Regulation 2024/223 identifies the priority that should be afforded renewable energy development whenever the balancing of legal interests is required in individual cases and where those projects introduce additional compensation requirements for species protection.

1.6.9 Reduction of Carbon Emissions and Other Greenhouse Gases

The production of renewable energy from the Proposed Project will assist in achieving the Government's and EU's stated goals of ensuring safe and secure energy supplies, promoting an energy future that is sustainable and competitively priced to consumers whilst combating energy price volatility and the effects of climate change. The Energy White Paper in 2015 outlines an ambitious Greenhouse gas reduction target of between 80% to 95% compared to 1990 levels out to 2050. Furthermore, if national carbon emissions targets are divided out amongst each county, each Local Authority may be responsible for meeting its own targets.

In addition to a reduced dependence on oil and other imported fuels, the generation of electricity from wind power by the Proposed Lifetime Extension will displace approximately 18,852 tonnes of carbon emissions per annum from the largely carbon-based traditional energy mix, the detail of which is presented in Section 11.4.3 in Chapter 11: Climate of this EIAR.

The World Health Organisation (WHO) in 2019 estimated that ambient (outdoor) air pollution caused 4.2 million deaths worldwide in 2019.[35] The Environmental Protection Agency (EPA) report '*Air Quality in Ireland 2022*'[36] noted that in Ireland, the premature deaths attributable to poor air quality are estimated at 1,300 people per annum. The European Environmental Agency (EEA) Report, '*Air Quality in Europe – 2022 Report*'[37] highlights the negative effects of air pollution on human health. The report assessed that poor air quality in Europe accounted for premature deaths of approximately 238,000 people in the 27 EU Member States in 2021. The estimated impacts on the population in Europe of exposure to NO_2 and O_3 concentrations in 2021 were around 49,000 and 24,000 premature deaths per year, respectively. Of these numbers, 610 deaths due to poor air quality were estimated in Ireland in 2020 with 490 Irish deaths attributed to $PM_{2.5}$, 50 Irish deaths attributed to nitrogen oxides (NO_2) and 70 Irish deaths attributed to Ozone (O_3). These emissions, along with others, including sulphur oxides (SO_x), are produced during fossil fuel-based electricity generation in various amounts, depending on the fuel and technology used, emissions from industry and power plants, vehicles emissions and transport fuels.

The EPA 2016 report '*Ireland's Environment – An Assessment*'[38] states that the pollutants of most concern are NOx, (the collective term for the gases nitric oxide and nitrogen dioxide, PM (particulate matter) and O_3 (ozone). The EPA 2016 report goes on to state that:

> *"Ireland has considerable renewable energy resources, only a fraction of which are utilised to address our energy requirements.*
>
> *Wind, ocean, solar, hydro and geothermal energy do not produce GHG emissions or emissions of air pollutants such as particulates, sulphur dioxide and nitrogen dioxide. Use of these renewable resources can have* ***considerable co-benefits for human health and***

[35] *https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health*
[36] *Air Quality in Ireland Report 2022 <https://www.epa.ie/publications/monitoring–assessment/air/Air_Quality_Report_22_v8v2.pdf>*
[37] *Air Quality in Europe 2022 <https://www.eea.europa.eu/publications/air-quality-in-europe-2022>*
[38] *Ireland's Environment – An Assessment (2016) <https://epawebapp.epa.ie/ebooks/soe2016/files/assets/basic-html/page-1.html#>*

***ecosystems**. Meeting energy requirements from renewable resources can provide significant economic and employment benefits at local to national scales."*

The Proposed Lifetime Extension therefore represents an opportunity to further harness Ireland's significant renewable energy resources, with valuable benefits to air quality and climate and in turn to human health. The consumption of fossil fuels for energy results in the release of particulates, sulphur dioxide and nitrogen dioxide to our air. The use of wind energy, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide SO_2, thereby resulting in cleaner air and associated positive health effects.

1.6.10 Economic Benefits

In addition to helping Ireland avoid significant fines and reducing environmentally damaging emissions, the Proposed Project will have significant economic benefits. At a national level, Ireland currently has one of the highest external dependencies on imported sources of energy, such as coal, oil and natural gas. As detailed in the SEAI Report '*Energy in Ireland – 2023 Report'*, Ireland has a high import dependence on oil and gas and is essentially a price-taker on these commodities. The '*Energy in Ireland 2022 Report*'[39] stated that 2021 was the first year since 2016, in which Irelands indigenous production of energy from renewables (17,500 GWh) exceeded that of indigenous gas (14,600 GWh); however, in 2022 indigenous gas production once again exceeded renewables production. The SEAI estimates electricity emissions to be 7.3 $MtCO_2e$ in 2023, the addition of this best estimate for 2023 to the definitive 2021 and 2022 electricity emissions reported by the EPA identifies a 3-year 2021 - 2023 total of 27.0 $MtCO_2e$. The 5-year 2021-2025 sectoral emission ceiling for electricity is 40 $MtCO_2e$. This means that 13.0 $MtCO_2e$ of budgeted electricity emissions will remain for the last 2 years of the 2021-2025 carbon budget. To remain within its sectoral emission ceiling, electricity emissions would therefore need to remain below an average of 6.5 $MtCO_2e$ in both 2024 and 2025.The SEAI report '*Energy in Ireland – 2023 Report'* indicated that wind energy:

- Accounted for 85.7% of renewable energy generated in 2022
- Capacity at the end of 2022 was 4.54GW, this is a 4.6% increase from wind energy capacity in 2021 (Note: installed wind capacity has increased to 4,767MW as of June 2024 according to Wind Energy Ireland.)

The 2014 report '*The Value of Wind Energy to Ireland'*, published by Pőyry, stated that growth of the wind sector in Ireland could support 23,850 jobs (construction and operational phases) by 2030. If Ireland instead chooses to not develop any more wind, then by 2030 the country will be reliant on natural gas for most of our electricity generation, at a cost of €671 million per annum in fuel import costs.

In April 2021, Wind Energy Ireland published a report produced by KPMG on the '*Economic Impact of Onshore Wind in Ireland*' stating that Irish wind farms are worth €400 million to the economy every year and it is expected to rise to €550 million by the end of the decade. If Ireland are to achieve the 8,200 MW target set in the Climate Action Plan 2021, the total industrial output across operating and capital activities would rise from 1.1bn in 2020 (from the 4,200 MW installed capacity at the time of writing of report) to 1.5bn in 2030.

The Proposed Project will be capable of providing power to approximately 18,469 households every year, as presented in the calculations in Section 4.3.1.5 of this EIAR.

The Proposed Project will help to supply the rising demand for electricity, resulting from renewed economic growth. The EirGrid report '*All-Island Generation Capacity Statement 2022 – 2031'* (October

[39] *Sustainable Energy Authority Ireland (2022) Energy in Ireland – 2022 Report*

2022) notes that the median electricity demand forecast on the island of Ireland is expected to grow by 21% in 2030. Much of this growth is expected to come from new data centres in Ireland.

The Proposed Project will have both long-term and short-term benefits for the local economy including income to local landowners, job creation, work opportunities for local businesses and service providers, local authority commercial rate payments and the continuation of the existing Community Benefit Fund.

Commercial rate payments from the Proposed Project will be provided to the respective local authority each year which will be redirected to the provision of public services. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

It is estimated that the Proposed Project has the potential to create up to 2-3 jobs during operational and maintenance phases. Further details on employment associated with the Proposed Project are presented in Section 5.10.2.2 in Chapter 5: Population and Human Health of this EIAR.

1.7 Purpose and Scope of the EIAR

The purpose of this EIAR is to document the current state of the environment on and in the vicinity of the Site Project and to quantify the likely significant effects of the Proposed Project on the environment. The compilation of this document served to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from the possibility of any negative impacts arising from the Proposed Project.

It is important to distinguish the Environmental Impact Assessment (EIA) to be carried out by the Planning Authority and the EIAR. The EIA is the assessment carried out by the competent authority, which includes an examination that identifies, describes and assesses in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11 of the Environmental Impact Assessment Directive, the direct and indirect significant effects of the Proposed Project on the following:

a) *Population and human health*
b) *Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC*
c) *Land, soil, water, air, and climate*
d) *Material assets, cultural heritage and the landscape*
e) *The interaction between the factors referred to in points (a) to (d)*

The EIAR submitted by the applicant provides the relevant environmental information to enable the EIA to be carried out by the competent authority. The information to be contained in the EIAR is prescribed in Article 5 and Annex IV of the revised EIA Directive and Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended) described in Section 1.2 above.

1.8 Structure and Content of the EIAR

1.8.1 General Structure

The EIAR uses the grouped structure method to describe the existing environment, the potential impacts of the Proposed Project thereon and the proposed mitigation measures. Background information relating to the Proposed Project, scoping and consultation undertaken and a description of the Proposed Project are presented in separate sections. The grouped format sections describe the impacts of the Proposed Project in terms of population and human health, biodiversity, ornithology, soils and geology, hydrology and hydrogeology, air quality, climate, noise and vibration, landscape and

visual, cultural heritage and material assets such as traffic and transportation, together with interaction of the foregoing.

The chapters of this EIAR are as follows:

1. Introduction
2. Background to the Proposed Project
3. Considerations of Reasonable Alternatives
4. Description of the Proposed Project
5. Population and Human Health
6. Biodiversity
7. Ornithology
8. Land, Soils, and Geology
9. Hydrology and Hydrogeology
10. Air Quality
11. Climate
12. Noise and Vibration
13. Landscape and Visual
14. Archaeology, Architectural and Cultural Heritage
15. Material Assets (including Traffic and Transport, Telecommunications and Aviation)
16. Major Accidents and Disasters
17. Interaction of the Foregoing
18. Schedule of Mitigation

The EIAR also includes a non-technical summary, which is a condensed and easily comprehensible version of the EIAR document. The non-technical summary is laid out in a similar format to the main EIAR document and comprises a description of the Proposed Project followed by the existing environment, impacts and mitigation measures presented in a grouped format.

1.8.2 Description of Likely Significant Effects and Impacts

As stated in the *'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EPA, May 2022), an assessment of the likely impacts of a Proposed Project is a statutory requirement of the EIA process. The statutory criteria for the presentation of the characteristics of potential impacts requires that potential significant impacts are described with reference to the extent, magnitude, complexity, probability, duration, frequency, reversibility and trans-frontier nature (if applicable) of the impact.

The classification of impacts in this EIAR follows the definitions provided in the Glossary of Impacts contained in the following guidance documents produced by the Environmental Protection Agency (EPA):

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, May 2022)
- 'Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report' (EC, 2017).
- 'Revised Guidelines on the Information to be contained in Environmental Impact Statements – Draft September 2015' (EPA, 2015).
- 'Advice Notes for Preparing Environmental Impact Statements – Draft September 2015' (EPA, 2015).
- 'Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (EPA, 2003).

The European Commission published a number of guidance documents in December 2017 in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU as amended by 2014/52/EU) including 'Guidance on Screening', 'Guidance on Scoping' and 'Guidance on the preparation of the Environmental Impact Assessment Report', which have also been consulted.

Table 1-2 presents the glossary of impacts as published in the EPA guidance documents. Standard definitions are provided in this glossary, which permit the evaluation and classification of the quality, significance, duration and type of impacts associated with a Proposed Project on the receiving environment. The use of pre-existing standardised terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across all disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the Proposed Project on the receiving environment.

Table 1-2 Impact Classification Terminology (EPA, 2022)

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An effect capable of measurement but without significant consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
	Profound	An effect which obliterates sensitive characteristics
Extent & Context	Extent	Describe the size of the area, number of sites and the proportion of a population affected by an effect
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions

Probability	Likely	Effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented
	Unlikely	Effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented
Duration and Frequency	Momentary	Effects lasting from seconds to minutes
	Brief	Effects lasting less than a day
	Temporary	Effects lasting less than a year
	Short-term	Effects lasting one to seven years
	Medium-term	Effects lasting seven to fifteen years
	Long-term	Effects lasting fifteen to sixty years
	Permanent	Effect lasting over sixty years
	Reversible	Effects that can be undone, for example through remediation or restoration
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Type	Indirect	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing'	The environment as it would be in the future should the subject project not be carried out
	Worst Case'	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect

	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents

Each impact is described in terms of its quality, significance, duration and type, where possible. A 'Do-Nothing' impact is also predicted in respect of each environmental theme in the EIAR. Residual impacts are also presented following any impact for which mitigation measures are prescribed. The remaining impact types are presented as required or applicable throughout the EIAR. Any potential interactions between the various aspects of the environment assessed throughout this EIAR are presented in Chapter 17: Interaction of the Foregoing.

1.9 Project Team

1.9.1 Project Team Responsibilities

The companies listed in Table 1-3 were responsible for completion of the EIAR of the Proposed Project. Further details regarding project team members are provided below.

The EIAR project team comprises a multidisciplinary team of experts with extensive experience in the assessment of wind energy developments and in their relevant area of expertise. The qualifications and experience of the principal staff from each company involved in the preparation of the EIAR are summarised in Section 1.9 below. Each chapter of this EIAR has been prepared by a competent expert in the subject matter, further details on project team expertise are provided in the Statement of Authority at the beginning of each impact assessment chapter.

Table 1-3 Project Team

Consultants	Project Staff Involved in Project	EIAR Input
MKO Tuam Road Galway H91 VW84	Michael Watson Sean Creedon Eoin McCarthy Natalia Stolarska Michéal Cahill Colm Ryan Meabhann Crowe Sean McCarthy Mike Amiel Mekell Pat Roberts John Hynes Aoife Joyce Nora Szijarto Sara Fissolo Aran v.d. Geest Moroney Cathal Bergin Padraig Cregg Susan Doyle Ciaran McKenna Conor Rowlands Donnacha Woods Catherine Johnson Jack Workman Keelan Crawford Gabriela Oliveira	Project Management, Scoping and Consultation, Preparation of the following Report Sections: *1. Introduction* *2. Background to the Proposed Project* *3. Considerations of Reasonable Alternatives* *4. Description of the Proposed Project* *5. Population & Human Health* *6. Biodiversity* *7. Ornithology* *10. Air Quality* *11. Climate* *13. Landscape & Visual* *15. Material Assets (non-Traffic)* *16. Major Accidents and Natural Disasters* *17. Interaction of the Foregoing* *18. Schedule of Mitigation*

AWN Consulting Ltd. The Tecpro Building, Clonshaugh Business and Technology Park Dublin 17	Dermot Blunnie	Baseline Noise Survey, Preparation of EIAR Section: *12.Noise and Vibration*
Triturus Environmental Ltd. 42 Norwood Court, Rochestown, Co. Cork, Cork	Ross Macklin	Aquatic and fisheries baseline survey 6. Biodiversity
Irish Archaeology Consultancy Unit G1, Network Enterprise Park, Kilcoole, Co. Wicklow	Faith Bailey	Preparation of EIAR Section: *14.Archaeological, Architectural and Cultural Heritage*
Hydro Environmental Services 22 Lower Main Street, Dungarvan, Waterford	Michael Gill Conor McGettigan	*Preparation of EIAR Section:* *8.Lands Soil and Geology;* *9.Hydrology and Hydrogeology*
Gavin and Doherty Geosolutions **Unit A2, Nutgrove Office Park, Rathfarnham, Dublin.**	Chris Engleman	Preparation of Peat Stability Risk Assessment *8.Lands Soil and Geology;*
Alan Lipscombe Traffic and Transport Consultants Claran, Headford Co. Galway	Alan Lipscombe	Sightline Review *15.Material Assets (Traffic and Transport)*

1.9.2 Project Team Members

1.9.2.1 MKO

Michael Watson BA. MA. CEnv. PGeo

Michael Watson is a Director of Environment in MKO. Michael has over 20 years' experience in the environmental sector. Following the completion of his master's degree in environmental resource management, Geography, from National University of Ireland, Maynooth he worked for the Geological Survey of Ireland and then a prominent private environmental & hydrogeological consultancy prior to joining MKO in 2014. Michael's professional experience includes managing Environmental Impact Assessments, EPA License applications, hydrogeological assessments, environmental due diligence and general environmental assessment on behalf of clients in the wind farm, waste management, public sector, commercial and industrial sectors nationally. Michaels key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Michael is a key member of the MKO senior management team and as head of the Environment Team has responsibilities to mentor various grades of team members, foster a positive and promote continuous professional development for employees. Michael also has a

Bachelor of Arts Degree in Geography and Economics from NUI Maynooth, is a Member of IEMA, a Chartered Environmentalist (CEnv) and Professional Geologist (PGeo).

Sean Creedon BSc. MSc

Sean Creedon is an Associate Director in the Environment Team at MKO. He leads a team of highly skilled environmental professionals working on EIAR for large-and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He has worked on the planning and environmental impact elements within all stages of wind farm project delivery. Sean's professional experience includes the development and management of a portfolio of wind farm developments to the consenting decision. He is a member of the MKO senior management team. Sean has over 22 years' experience in program and project development, holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

Eoin McCarthy BSc

Eoin is a Project Director with McCarthy O'Sullivan Ltd. with over 13 years of environmental consultancy experience. Eoin holds B.Sc. (Hons) in Environmental Science from NUI, Galway. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment. Since joining MKO in 2011, Eoin has been involved as a Graduate, Assistant and Project Environmental Scientist on a significant range of energy infrastructure, tourism, waste permit, flood relief scheme and quarrying projects. He has overseen some of the largest SID wind energy in Ireland in in that time. In his role as project manager, Eoin works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Eoin is also involved in the development of project strategy for the projects that he manages. He has held the role of project manager on over 550MW worth of wind energy projects. Within MKO Eoin plays a large role in the management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

Natalia Stolarska Bsc Msc

Natalia Stolarska is a Graduate Environmental Scientist with MKO. Natalia holds a BSc in Earth and Ocean Science and an MSc in Environmental Leadership. Natalia's key strengths and areas of expertise are in drafting EIAR report chapters, wind farm feasibility studies and QGIS mapping. Since joining MKO in September 2023, Natalia has been involved as a Graduate Environmental Scientist in a range of wind farm projects, assisting with field work, client briefing notes, constraints mapping and drafting EIAR chapters, with more projects in the pipeline.

Michéal Cahill (BSc. Env)

Michéal Cahill is a Graduate Environmental Scientist with MKO with 1 years' experience in environmental consultancy. Michéal holds a first-class honours degree in Environmental Science at University of Galway and was awarded the Professor Emer Colleran Medal for his academic achievements. Prior to taking up his position with MKO in June 2024, Michéal previously worked as an environmental sustainability intern with RPS Group. Michéal has previous experience in the preparation and review of Environmental Impact Assessment Reports for both offshore and onshore wind farm projects, as well as aiding in the research and design phase of a proposed pumped hydroelectric storage plant. Michéals key strengths and areas of expertise are in environmental impact assessment, the preparation and writing of high-quality reports, proficiency in geographic information systems, ecological assessment and risk assessment. As an environmental scientist within MKOs

environmental renewables team, Michéal is involved in the preparation and revision of a variety of reports for a range of energy infrastructure projects.

Colm Ryan

Colm Ryan is the Planning Director of MKO, Planning & Environmental Consultants, with over 16 years of experience as a planner in both private practice and public sector combined. Prior to joining MKO, Colm worked as a planner with a UK and Ireland based Renewable Energy developer. Colm has also spent part of his career in local authority as a planner with Laois County Council. Colm has significant experience in a wide range of projects and extensive experience in large scale residential, renewables and marine based developments. Colm currently heads up the Planning Division in MKO with responsibility for Planning, Project Management, Health & Safety and Project Communications. Colm holds BA (Hons) in Geography & Irish and Masters in Civic Design Town & Regional Planning. Prior to taking up his position with MKO in May 2017, Colm worked as a Senior Planner with Lightsource Renewable Energy Ltd. and held previous posts with Partnerships for Renewables, South Kesteven District Council, Planning Aid, Frank O Gallachoir & Associates in Bray and Laois County Council. Colm is a chartered town planner with specialist knowledge in renewable energy, mixed use development and residential. Colm's key strengths and areas of expertise are in large scale renewable energy development particularly in the ground mounted solar, delivery of local community engagement processes on contentious planning applications, management of community and developers interest through the planning process and post or pre-planning due diligence. Since joining MKO as a Senior Planner Colm has been overseeing and managing a wide range of development projects such as large scale solar applications, site feasibility work for potential wind energy projects, large scale housing and mixed use schemes. Within MKO Colm plays a large role in the management of staff members including several aspects of business development. Colm has proven negotiation skills and stakeholder relationship building across numerous development projects in Ireland and the UK and is a corporate member of the Irish Planning Institute.

Meabhann Crowe

Meabhann Crowe is a Project Director within the Planning Renewables team in MKO and has over 15 years private sector experience. She is a fully chartered member of the Royal Town Planning Institute (MRTPI). Meabhann holds a BA (Hons) in Geography, Sociological and Political Science and a Masters in Urban and Regional Planning. Prior to taking up her position with McCarthy Keville O'Sullivan in October 2018, Meabhann was employed as an Associate Director with Colliers International in their Edinburgh office, prior to which she was employed for several years with Halliday Fraser Munro. In her time in the industry Meabhann has been active on a number of instructions across a broad spectrum of mixed-use, residential, commercial, renewable energy and retail projects.

Meabhann brings particular expertise in initial development feasibility appraisals and development strategies. Her experience in managing large multi-disciplinary teams in the preparation of local and major planning applications across residential, mixed-use and retail developments means she has a wealth of knowledge to draw on in the early stages of development. She has particular experience in preparing and managing project strategies which include both responding to emerging planning policy whilst also preparing and progressing complex planning applications and appeals.

Sean McCarthy

Sean McCarthy is a Project Director in the Planning Team at MKO with over 10 years of experience in both private practice and local authorities. Sean holds a BSc. (Hons) in Property Studies from ATU and a Masters in Regional & Urban Planning for Heriot Watt University in Edinburgh. Prior to taking up his position with McCarthy Keville O'Sullivan in September 2015, Sean worked as a Planning Officer with the Western Isles Council in Scotland in the UK and prior to that worked as a Graduate Planner with Tipperary County Council. Sean is a chartered member of the Royal Town Planning Institute with

extensive experience in residential, commercial, industrial, quarries and healthcare development projects.

Sean has been involved in complex and large-scale development projects from inception through to planning permission both as a project manager and working as part of wider design teams. Sean has extensive experience in working on Strategic Housing Development Projects/Large Scale Residential Development Projects and EIAR projects. Within MKO, Sean plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce planning applications.

Mike Amiel Mekell BA, MSc

Mike Amiel Mekell is a Graduate Planner with MKO having joined the company in June 2024. Mike holds a BA (Hons) in Politics, International Relations and Sociology from University College Dubin and an MSc (Hons) in Planning and Development from Queen's University Belfast. He is a Licentiate of the Royal Town Planning Institute. Prior to taking up his position with MKO, Mike worked as a Graduate Environmental Planner with Roughan and O'Donovan. In this role he prepared Environmental Impact Assessment Screening and Scoping reports, environmental monitoring and management reports and planning reports for projects involving public and active transport infrastructure and sustainable tourism development.

His main responsibilities include preparing planning application documents and reports, preparing inputs for Environmental Impact Assessment Reports and liaising with multidisciplinary project teams

Pat Roberts B.Sc. (Env.)

Pat Roberts is Principal Ecologist with MKO with over 18 years post graduate experience of providing ecological services in relation to a wide range of developments at the planning, construction and monitoring stages. Pat holds B.Sc. (Hons) in Environmental Science. Pat has extensive experience of providing ecological consultancy on large scale industrial and civil engineering projects. He is highly experienced in the completion of ecological baseline surveys and impact assessment at the planning stage. He has worked closely with construction personnel at the set-up stage of numerous construction sites to implement and monitor any prescribed best practice measures. He has designed numerous Environmental Operating Plans and prepared many environmental method statements in close conjunction with project teams and contractors. He has worked extensively on the identification, control and management of invasive species on numerous construction sites. Prior to taking up his position with MKO in June 2005, Pat worked in Ireland, USA and UK as a Tree Surgeon and as a nature conservation warden with the National Trust (UK) and the US National Park Service. Pats key strengths include his depth of knowledge and experience of a wide range of ecological and biodiversity topics and also in his ability to understand the requirements of the client in a wide range of situations. He is currently responsible for staff development, training and ensuring that the outputs from the ecology team are of a very high standard and meet the requirements of the clients and relevant legislation and guidelines. He is a full member of the Chartered Institute of Ecologists and Environmental Managers (CIEEM)

John Hynes M.Sc. (Ecology), B.Sc.

John Hynes is the Ecology Director at MKO, with over 12 years' professional experience in the public and private sector. John oversees MKO's Ecology, Ornithology, Forestry, Bats, and GIS teams. John holds a B.Sc. in Environmental Science and a M.Sc. in Applied Ecology.

John's key strengths and areas of expertise are in Appropriate Assessment of plans and projects, Ecological Impact Assessment, Flora and Fauna survey methods and design, project management and project strategy. John is experienced as a coordinator or large multi-disciplinary teams on complex ecological projects. John has been involved as a lead Ecologist on a range of energy infrastructure,

commercial, transport, housing, forestry, biodiversity net gain and nature restoration projects. John is a Full member of the Chartered Institute of Ecology and Environmental Management, a member of Galway County Council Climate and Biodiversity Special Policy Committee (SPC) and a contributor to the Wind Energy Ireland (WEI) Biodiversity and Sustainability Working Group.

Aoife Joyce M.Sc. (Agribioscience), B. Sc

Aoife Joyce is a Project Director (Ecology) with 5 years' professional experience in ecological assessments and has completed CIEEM and BCI courses in Bat Impacts and Mitigation, Bat Tree Roost Identification and Endoscope training, Bat ID, Trapping and Handling and Kaleidoscope Pro Analysis. She is a graduate of Environmental Science (Hons.) at University of Galway, complemented by a first-class honours MSc in Agribioscience. Prior to taking up her position with MKO in 2019, Aoife held previous posts with Inland Fisheries Ireland and Treemetrics Ltd. She has a wide range of experience from bat roost identification, acoustic sampling, sound analysis, electrofishing, mammal and habitat surveying to GIS, soil and water sampling, Waste Acceptability Criteria testing, Environmental Impact Assessments (EIAs) and mapping techniques. Since joining MKO, Aoife has been involved in managing bat survey requirements for a variety of renewables planning applications, as well as commercial, residential and infrastructure projects. This includes scope development, project coordination, roost assessments, remote bat detector deployment, dawn and dusk bat detection surveys, bat handling, sonogram analyses, mapping, impact assessment, mitigation design inputs and report writing. Within MKO, she oversees the bat team and works as part of a wider multidisciplinary team to help in the production of ecological reports and assessments. Aoife is a member of Bat Conservation Ireland and CIEEM and holds current Bat Roost Disturbance and bat photography licenses.

Sara Fissolo

Sara Fissolo is a Project Ecologist with MKO with over 4 years' experience in ecological consultancy. Sara holds a BSc. (Hons) in Ecology and Environmental Biology from University College Cork. Sara first joined MKO in 2019 and is now a member of MKO's dedicated bat unit, where she scopes and manages bat survey requirements for a variety of projects, including wind-farms planning applications. She has specialised in carrying out bat survey requirements for developments and nature conservation projects, including habitat appraisals and roost assessments, manual/static activity surveys and data analysis, and produces bat report outputs to inform Ecological Impact Assessments, Environmental Impact Assessments and Appropriate Assessments. Sara's role includes keeping up to date with scientific literature and guiding her team and the rest of the ecology team on how to assess impacts on bats. She attended Wildlife Acoustics, Bat Conservation Ireland (BCI), Bat Conservation Trust (BCT) and CIEEM courses on surveying heritage buildings for bats, on performing advanced survey techniques and identification, on bats and lighting, on performing bat care, on assessing the impact of developments on bats and on the use of Kaleidoscope Pro Software. Sara is a member of BCI, for which she carries out volunteer surveys, is a qualifying member of CIEEM and holds a current Bat Roost Disturbance Licence from NPWS.

Nora Szijarto

Nora Szijarto is a Bat Ecologist with MKO. Nora holds BSc. Biology and MSc. in Behaviour, Conservation and Evolution from the University of Lausanne (Switzerland). Prior to taking up her position with MKO in March 2022, Nora worked as a Fieldwork Research Assistant with the Department of Ecology and Evolution at Lausanne University. Her research projects were related to insect's gut microbiology and stress behaviour in horses. She also has experience in the study of microplastic pollution in waters. Nora's key strengths and areas of expertise are bat surveys, data and statistical analysis and report writing. Since joining MKO Nora has been involved in the bat team working on mostly proposed wind farm sites. This includes bat roost assessment, static acoustical surveys, transect surveys, emergence and re-entry surveys, sound analysis, mapping, mitigation and report writing. Nora holds chartered membership with the CIEEM.

Aran von der Geest Moroney B.Sc.

Aran von der Geest Moroney is a Project Ecologist with MKO having joined the company in February 2021 and having over 3 years' experience in professional ecological consultancy. Aran holds a first-class honours BSc (Hons) in Ecology and Environmental Biology from University College Cork. Aran has also completed a Level 8 Special Purpose Award in Digital Mapping and GIS. Aran's key strengths and areas of expertise are wintering bird surveying and identification, freshwater macroinvertebrate identification and sampling, freshwater pearl mussel surveying, white-clawed crayfish surveying, electric fishing, bat surveys, GIS, habitat mapping, preparation of Stage 1 and Stage 2 Appropriate Assessment reports and Ecological Impact Assessment. Since joining MKO, Aran has been involved in a range of mixed use, residential, industrial, restoration, public services, wind energy and forestry projects. Aran has carried out a wide range ecological field surveys in accordance with NRA Guidelines, bat surveys, bird surveys, recording vegetation relevés and freshwater quality analysis using bioindicators. Aran has provided supervision as an ecological clerk of works in residential and wastewater infrastructure projects. Aran is trained in carrying out bat surveys, non-volant mammal surveys, bird surveys, freshwater pearl mussel surveys, white-clawed crayfish surveys, electric fishing surveys, river condition assessment surveys and in taking vegetation relevés of vascular plants and has experience in habitat identification and habitat mapping. Within MKO, Aran is responsible for independently carrying out and planning a range of ecological field surveys in accordance with NRA Guidelines and carrying out Appropriate Assessment screenings, Natura Impact Statements, Ecological Impact Assessments, Biodiversity chapters for EIARs, Invasive Species Management Plans and Aquatic reports as part of the ecology team. Aran is a member of CIEEM, holds a current Bat Roost Disturbance licence and holds an IFM Certificate in Electric Fishing.

Cathal Bergin – Project Ecologist and Conservation Detection Dog Handler

Cathal is a Project level Ecologist and Conservation Detection Dog Handler and Trainer with MKO having joined the company in June 2020. Cathal holds a BSc (Hons) in Wildlife Biology where he focused his studies on ecology and mammal surveys. Cathal's key strengths and expertise are in mammal surveys (bats, badgers and otters), invasive species surveys, QGIS mapping and report compiling. Since joining MKO, Cathal has been involved in a range of windfarm, solar farm and SHD projects.

MKO's Conservation Detection Team is led by Cathal Bergin (B.Sc.). He holds diplomas in Canine Behaviour, Dog Training, Canine Nutrition and Canine First Aid.

Cathal is a certified LANTRA accredited conservation detection dog handler. He is also training to become an accredited detection dog trainer with experience in; identification of bird and bat carcasses, plant and habitat identification and has conducted numerous ecological surveys on existing wind farms sites across Ireland.

Padraig Cregg M.Sc., B.Sc.

Padraig Cregg is employed as a Principal Ornithologist for MKO and has over 11 years' experience of working in environmental consultancies. In his role with MKO, he acts as technical advisor for the ornithology team helping to take projects through their full lifecycle, from site selection through survey design, constraints studies, impact assessment and lodgement of the planning application. He is responsible for training the ornithology team and undertakes to keep up-to-date and keep his colleagues updated on all emerging guidance, legislation, policies, initiatives, industry best practice and emerging trends and market opportunities. Padraig joined MKO in 2018.

Donnacha Woods

Donnacha Woods is a Project Ornithologist with MKO with over 9 years of experience in both private consultancy and public conservation work. He holds a BSc (Hons) in Zoology, and a MSc (Hons) in

Biodiversity and Conservation where he focused his studies on feather morphology and its implications on bird flight. Donnacha's key strengths and expertise are bird surveying and identification, survey design, data analysis and report writing. Prior to joining MKO in August 2020, Donnacha has worked in private consultancy as an ecologist with Mott MacDonald and Enviroguide, and has also worked with BirdWatch Ireland and equivalent conservation organisations in France and Canada. Since joining MKO, Donnacha has been involved in a range of wind energy projects, in addition to projects in housing, education, afforestation, fishing and other sectors. In his role as a project manager, Donnacha works with and co-ordinates a team within MKO's Ornithological department, as well as sub-contractor ornithologists, in the collection and analysis of data for the production of EIAR Bird chapters, Natura Impact Statements and other reports as required. Donnacha is also experienced in impact assessment and in the writing of EIAR Bird Chapters for large-scale wind energy projects.

Susan Doyle BSc, MSc, PhD

Susan Doyle is an ornithologist at MKO. She completed her primary degree in Zoology at Trinity College Dublin in 2013, followed by her master's degree in Ecological Assessment in University College Cork in 2014 and PhD (researching Arctic-breeding birds) in University College Dublin in 2021. Susan has 7 years' experience in ecological consultancy and has worked on wind farm projects, residential developments, data centres, county council projects and National Parks and Wildlife Service projects. She specialises in ornithological consulting, including Environmental Impact Assessments and operational monitoring. Prior to joining MKO in October 2020, Susan gained experience through her involvement in several bird conservation projects, including protected seabirds, waders and waterfowl, as well as research into satellite telemetry in migrant birds, breeding hen harrier and avian diseases in Ireland, providing her with extensive experience in a wide variety of bird survey methods, data management and reporting.

Conor Rowlands

Conor Rowlands is an Ornithologist with MKO having joined the company in June 2021. Conor holds a BSc (Hons) degree in Field Biology and Wildlife Tourism from the Institute of Technology Tralee. Prior to taking up his position with MKO, Conor worked as a Curlew Advisory Officer during the 2021 Curlew Conservation Programme in the Stack Mountains, Co. Kerry where he developed ornithological and project management skills. Conor's key strengths and expertise are bird identification, GIS, data collection, organisation and report writing. Since joining MKO, Conor has been involved in a range of wind farm projects. Within MKO, Conor plays a key role in conducting a range of ornithological surveys, collecting and managing data, writing interim and end of season reports.

Ciarán McKenna

Ciarán is a Project Ornithologist at MKO, earned his BA (Hons) in Wildlife Biology from I.T. Tralee in 2016 and has amassed over 7 years of valuable experience in ecology consultancy. Specializing in windfarm projects, with additional experience in road and National Parks and Wildlife projects, Ciarán joined MKO in March 2018 after serving as a graduate ecologist at Malachy Walsh and Partners. He has knowledge of ecological survey techniques, encompassing mammals, bats, birds, and habitats. Ciarán's notable strength lies in ornithological surveys and has specialized training and experience in navigating challenging upland terrain. His skillset also includes data management, project management, and team leadership.

Catherine Johnson

Catherine is an Environmental Scientist and Climate Practitioner at MKO with 1 year of consultancy experience in climate and sustainability. Prior to joining MKO in 2022, Catherine worked as an Environmental Social Governance (ESG) analyst for Acasta in Edinburgh. Catherine has expertise in

internal climate law and policy, earth science, and sustainability/ESG processes. Catherine has a BSc in Earth and Ocean Science and an LLM in Global Environment and Climate Change Law.

Jack Workman

Jack is the Landscape & Visual Project Director at MKO, with over 5 years ecological experience, and a Technician Member of the British Landscape Institute. Jack is a Landscape and Visual Impact Assessment Specialist with an academic background in the field of Environmental Science and Geography. Jack's primary role at MKO is conducting Landscape and Visual Impact Assessment (LVIA) for Environmental Impact Assessment reports, as well as supporting the MKO graphics, CAD and drone surveying teams. Jack holds a BSc. in Psychology, and an MSc. in Coastal and Marine Environments (Physical Processes, Policy & Practice) where he was awarded the Prof. Máirín De Valéra distinction in science research award. Prior to taking up his position with MKO, Jack worked as a Geospatial Analyst and Research Assistant with the University of Galway and also held previous posts in the coastal engineering sector with Royal Haskoning DHV and Saltwater Technologies. Since joining MKO in February 2020, Jack has conducted and project managed all aspects of LVIA for a broad range of commercial infrastructure developments including wind and solar energy projects, grid infrastructure, extraction industry and Strategic Housing Developments. Jack holds a membership with the Chartered Institute of Water and Environmental Management and is also a member of the Landscape Research Group.

Keelan Crawford

Keelan is a LVIA Specialist with MKO with 1 years of experience in both private practice and local authorities. Keelan holds BA (Hons) in Geography & economics and Masters in applied coastal and marine management. Prior to taking up his position with MKO in September 2023, Keelan's key strengths and areas of expertise are in GIS and landscape and visual impact assessments his primary role at MKO is conducting LVIAs and writing the Landscape and Visual chapter of EIA reports.

Gabriela Oliveira

Gabriela is a CAD Technician at MKO with over 6 years of drafting experience in various sectors of the building industry. She holds BSc (Hons) in Architecture and Urbanism from University of Fortaleza, Ceara, Brazil. Prior to taking up her position with MKO in July 2023, Gabriela worked as an Architect for Fergal Bradley & Co. and as an Architect Assistant Graphic Design for an engineer company. She was primarily involved in a variety of Commercial / Residential / Landscape projects where she was responsible for the planning drawing packages but also has experience working in FSC's /DAC's and one-off housing planning applications. Her key strengths and areas of expertise are in Auto CAD, Revit and SketchUp (3D).

1.9.2.2 AWN

Dermot Blunnie

Dermot Blunnie (Principal Acoustic Consultant) holds a BEng (Hons) in Sound Engineering, MSc in Applied Acoustics and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has been working in the field of acoustics since 2008 and is a member of the Institute of Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA). He has extensive knowledge and experience in relation to commissioning noise monitoring and impact assessment of wind farms as well as a detailed knowledge of acoustic standards and proprietary noise modelling software packages. He has commissioned noise surveys and completed noise impact assessments for numerous wind farm projects within Ireland.

1.9.2.3 Irish Archaeological Consultancy

Faith Bailey MA BA (Hons), MCIfA, MIAI

Faith is an Associate Director and Senior Archaeologist and Cultural Heritage Consultant with IAC. She holds an MA in Cultural Landscape Management (archaeology and architecture) and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence eligible archaeologist, a member of the Chartered Institute of Field Archaeologists, a member of the Institute of Archaeologists of Ireland and has over 19 years' experience working in commercial cultural heritage sector. Faith joined IAC in 2004 and in her capacity as Senior EIA Archaeologist, she has been responsible for the production and delivery of a large number of archaeological and built heritage desk top assessments, EIA, master plans, LAP/SEA and management plan associated with all sectors of development in the Republic and Northern Ireland.

1.9.2.4 Alan Lipscombe Traffic and Transport Consultants

Alan Lipscombe

In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the University of Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic, including many wind farm developments including the following; Ardderroo, Derrinlough, Knocknamork, Shehy More, Cloncreen, Derrykillew, Ballyhorgan, Lettergull, Barnadivane, Cleanrath, Knockalough, Sheskin South and Borrisbeg.

Alan has a BEng (hons) Degree in Transportation Engineering (Napier University, Edinburgh, 1989), is a member of Engineers Ireland and of the Institute of Highways and Transportation and is a TII accredited Road Safety Audit Team Member.

1.9.2.5 Hydro Environmental Services

Michael Gill

Michael Gill P.Geo (BA, BAI, Dip Geol., MSc, MIEI) is a Civil/Environmental Engineer and Hydrogeologist with over 22 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms and renewable projects in Ireland. In addition, he has substantial experience in geological characterisation, peatland morphology, and surface water drainage design and SUDs design and surface water/groundwater interactions. Michael has worked on the EIS/EIAR for Oweninny WF, Cloncreen WF, Derrinlough WF and over 100 other wind farm related projects across the country.

Conor McGettigan

Conor McGettigan (BSc, MSc) is an Environmental Geoscientist with over 4 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor has prepared the hydrology and hydrogeology chapter of environmental impact assessment reports for several wind farm development on peatlands. Conor also routinely prepares hydrological and hydrogeological assessment reports, WFD

compliance assessment reports and flood risk assessments for a variety of development types including wind farms.

1.9.2.6 Gavin and Doherty Geosolutions

Chris Engleman

Chris is a Professional Geologist with a Master's degree in Geological Sciences from the University of Leeds. He is chartered with the Institute of Geologists Ireland (IGI) and European Federation of Geologists. He has five years of industry experience within the onshore renewables sector and the field of geological mapping with a particular focus on Quaternary geology, predominantly working on projects for peat stability and management, ground investigation, rock and soil logging, GIS mapping and geotechnical design. Chris has worked on several renewable energy projects, particularly wind and solar, for over two years.

1.10 Difficulties Encountered

There were no technical difficulties encountered during the preparation of this chapter of this EIAR.

1.11 Viewing and Purchasing of the EIAR

Copies of this EIAR, including the Non-Technical Summary (NTS), will be available online, via the Cork County Council and Kerry County Council Planning Websites. The EIAR and all associated planning documentation will also be available for viewing at the offices of the Cork County Council and Kerry County Council. The EIAR may be inspected free of charge or purchased by any member of the public during normal business hours, at the following addresses:

Cork County Council
Planning Department
Newtown Rd, Carricklawn,
Cork,
Y35 WY93

Kerry County Council
County Buildings
Rathass
Tralee
Co. Kerry
V92 H7VT

The EIAR will also be available to view online via the Department of Planning, Housing and Local Government's EIA Portal, which will provide a link to the planning authority's website on which the application details are contained. This EIA Portal was set up by the Department as an electronic notification to the public of requests for development consent which are accompanied by an EIAR (https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal).

Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

Chapter 2: Background to the Proposed Project

DOCUMENT DETAILS

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2. BACKGROUND TO THE PROPOSED PROJECT

This chapter of the Environmental Impact Assessment Report ('EIAR') presents information on renewable energy policy, climate change policy, biodiversity and nature restoration policy, and the strategic, national, regional and local planning context for the Proposed Project. This chapter also summarises the planning history, the scoping and consultation undertaken, as well as setting out the cumulative impact assessment process.

2.1 Introduction

The existing Taurbeg Wind Farm comprises 11 no. turbines with an overall ground-to-blade tip height of 108.2m, 38kV substation and all associated infrastructure. The wind farm is located approximately 3.5km south of Rockchapel and 10.5km northwest of Newmarket, County Cork, in the townlands of Glasheenanargid, Taurbeg and Taurmore. The existing wind farm and substation are accessed via the wind farm site entrance off an unnamed local road, in the townland of Taurbeg and is served by a network of existing wind farm access roads. Other land-uses within the site include private forestry, peat bogs and agricultural lands. The approximate grid reference location for the centre of the site is ITM 522519, 611858.

The existing turbines onsite will have reached the end of their permitted operational life in 2026, however they will have only been operating for a period of 20 years, despite the normal operational life of a turbine being more than this i.e. beyond a 30 year lifespan, as turbine technology and reliability continues to improve, and with strategic replacement of key components such as gearboxes, blades, sensors and electricals. The Bonus (now Siemens) SWT-2.3-82 turbines, of which 11 no. are present and operating on the Site, were commissioned in March 2006.

The Proposed Offsetting Lands are located in the townlands of Coom and Knockatee, County Kerry, approximately 8km east of Castleisland, and approximately 11.5km west of the Taurbeg Wind Farm Site. Current land-use within the Proposed Offsetting Lands is comprised predominantly of agricultural land and commercial forestry.

This chapter of the EIAR presents the policies and targets which have been put in place at the various levels of Government, at regional, national and international level in relation to renewable energy and climate change, and biodiversity and nature restoration. In the context of the current energy and climate crises, it is deemed the most environmentally prudent option to apply to extend the operational life of the existing turbines, rather than allow them to be decommissioned. The details below set out the need for the Proposed Lifetime Extension to assist the country in meeting its national targets and European commitments in relation to climate change, including decarbonisation and elaborates on the need for the development, as set out in Chapter 1: Introduction of this EIAR. This chapter also includes biodiversity and nature restoration policy, targets and commitments in relation to the Proposed Offsetting Measures.

2.1.1 Statement of Authority

MKO has developed extensive expertise and experience over the last 15 years in preparing Background and Planning Policy Context Chapters for a range of projects, including multiple large scale wind energy developments.

This chapter was led by Meabhann Crowe MRTPI with support from Mike Amiel Mekell RTPI Licentiate, of MKO. Meabhann Crowe is a Renewables Project Director with MKO with over 15 years private sector experience. She is a fully chartered member of the Royal Town Planning Institute

(MRTPI). Meabhann holds a BA (Hons) in Geography, Sociological and Political Science and a Master's in Urban and Regional Planning. In her time in the industry Meabhann has been active on a number of instructions across a broad spectrum of mixed-use, residential, commercial, renewable energy and retail projects. Meabhann brings particular expertise in initial development feasibility appraisals and development strategies. Her experience in managing large multi-disciplinary teams in the preparation of local and major planning applications across residential, mixed-use, renewable energy and retail developments means she has a wealth of knowledge to draw on in the early stages of development. She has particular experience in preparing and managing project strategies which include both responding to emerging planning policy whilst also preparing and progressing complex planning applications and appeals.

Mike Amiel Mekell is a Planner with MKO having joined the company in June 2024. Mike holds a BA (Hons) in Politics, International Relations and Sociology from University College Dubin and an MSc (Hons) in Planning and Development from Queen's University Belfast. He is a Licentiate of the Royal Town Planning Institute. Since joining MKO, Mike has been involved in a range of renewable energy projects including onshore wind, solar and grid infrastructure developments. His main responsibilities include preparing planning application documents and reports, preparing inputs for Environmental Impact Assessment Reports and liaising with multidisciplinary project teams.

This chapter was reviewed by Sean McCarthy MRTPI and Eoin McCarthy of MKO. Sean McCarthy is a Project Director in the Planning Team at MKO with over 10 years of experience in both private practice and local authorities. Sean holds a BSc. (Hons) in Property Studies from ATU and a Masters in Regional & Urban Planning for Heriot Watt University in Edinburgh. Prior to taking up his position with MKO in September 2015, Sean worked as a Planning Officer with the Western Isles Council in Scotland in the UK and prior to that worked as a Graduate Planner with Tipperary County Council. Sean is a chartered member of the Royal Town Planning Institute with extensive experience in residential, commercial, industrial, quarries and healthcare development projects. Sean has been involved in complex and large-scale development projects from inception through to planning permission both as a project manager and working as part of wider design teams. Sean has extensive experience in working on Strategic Housing Development Projects/Large Scale Residential Development Projects and EIAR projects. Within MKO, Sean plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce planning applications.

Eoin is a Project Director within the Environment Renewables team of MKO with over 14 years of environmental consultancy experience. Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway. Eoin took up his position with MKO in June 2011. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment. Since joining MKO, Eoin has progressed from Graduate to Project Director level and has been heavily involved on a significant range of energy infrastructure, tourism, waste permit, flood relief scheme and quarrying projects. He has overseen the design phase and applications of some of the largest wind energy projects in Ireland. In his role as project manager, Eoin works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Eoin is also involved in the development of project strategy for the projects that he manages. He has held the role of project manager and EIAR co-ordinator on almost 1GW worth of wind energy projects. Within MKO Eoin plays a large role in the management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

2.1.2 Planning History of the Existing Taurbeg Wind Farm

The existing Taurbeg Wind Farm comprises 11 no. Bonus (now Siemens) SWT-2.3-82 turbines, of 2.3 Megawatts (MW) each, with an overall blade to tip height of 108.2 metres. The existing Taurbeg Wind Farm became operational in 2006 and is connected to the national electricity grid at the existing

Glenlara 110kV Substation, located in County Cork. It should be noted that the grid connection does not form part of the accompanying Proposed Lifetime Extension planning application to Cork County Council (CCC) and is assessed as a cumulative project only within this EIAR.

The existing Taurbeg Wind Farm was permitted under 4 no. separate planning applications:

Table 2-1: Planning History of the existing Taurbeg Wind Farm

Applicant	Pl. Ref. No.	Decision Date	Description	Decision
Wind Farm Developments Ltd.	98/1483	05/7/1999	15 no. turbines transformers, 2 meteorological masts, access tracks, gates, control building, signs and ancillary works	Conditional Grant
ESB	01/6549	06/03/2002	Planning permission for 38 kV overhead line	Conditional Grant
Wind Farm Developments Ltd.	02/3608	07/04/2003	14 turbines, anemometer mast, control room/substation, temporary site compound/control room, access tracks and ancillary works	Conditional Grant
Taurbeg Ltd.	05/602	09/05/2005	Borrow pit to win road stone for on-site access tracks associated with construction of wind farm permitted under Reg. No.02/3608, and a short section of access track	Conditional Grant

An Environmental Statement (ES) was prepared to accompany the original application CCC Pl. Ref. N/02/3608. Planning permission was granted by CCC for the Taurbeg Wind Farm on the 7th of April 2003. The existing Taurbeg Wind Farm has been operational since March 2006, with the current planning permission set to expire in 2026. Planning condition no. 7 of the existing permission states:

> "*The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development.*"

The existing turbines are therefore due to be decommissioned in 2026. By this date, the existing turbines will have been in operation for only 20 years.

2.2 Renewable Energy Resources

It is well accepted now that fossil fuels are a finite resource and becoming increasingly scarce and expensive to extract. Renewable energy resources on the other hand offer a sustainable alternative to this dependency on fossil fuels and are continuously replenished through the cycles of nature. The previously adopted gradual shift to increasing our use of renewable energy is no longer viable. There is a renewed sense of urgency, exhibited at all policy levels, to ensure real change happens on the ground. Ireland's dependency on the importation of fossil fuels to meet its energy demands - 70% of energy is currently imported from abroad[1] – highlights a vulnerability in ensuring security of supply and price stability of energy. As such, maintaining and expanding indigenous renewable energy supply is critical.

2.3 Climate Change Policy and Targets

[1] *National Energy Security Framework (April 2022) https://www.gov.ie/pdf/?file=https://assets.gov.ie/221399/86cb99f5-58e3-4821-bc4c-e1bb1fa706fb.pdf#page=null*

International and national policy consistently identifies the need to reduce greenhouse gas (GHG) emissions and stresses the importance of reducing global warming. The context of international policy has altered over the last 30-years from being of a warning nature to the current, almost universally accepted belief, that there is a climate change emergency occurring both within Ireland and at a broader global scale. The Intergovernmental Panel on Climate Change (IPCC)'s Sixth Assessment Report[1] published in 2021 provides a stark assessment of global climate change and presents evidence that climate changes will increase in all regions of the globe over the coming decades and that much of the damage caused by climate change up to this point is now likely irreversible, such as the rise in sea levels over the 21st century.

"*The Status of Ireland's Climate 2023*"[2] published by Met Éireann similarly reflects on clear and distinct impacts arising from climate change effects within an Irish context:

- *"2023 was the warmest year on record for Ireland (record length 124 years).*
- *For the first time, Ireland's average annual temperature rises above 11 °C.*
- *2023 saw the warmest June on record.*
- *2023 saw the wettest March and the wettest July on record.*
- *For the first time in 23 years, four months of the year were within their top 5 warmest months on record (average stays between one and two months every year since the year 2000)."*

The IPCC, the United Nations (UN) body for assessing the science surrounding climate change, have noted in their Sixth Assessment Report in 2023 that a climate catastrophe is inevitable, but rather, there remains a 'narrow path' to determine the future course of climate, mainly by cutting emissions down to net zero. The Proposed Lifetime Extension will continue to contribute to the decarbonisation of the energy sector and reduce harmful emissions. In this regard, it is in compliance with national and international climate change policy and targets.

The World Meteorological Organisation's published their *'State of the Global Climate Report'* on the 19th of March 2025, according to the report:

- The global mean near-surface temperature in 2024 was 1.55 °C ± 0.13 °C above the pre-industrial 1850-1900 average.
- 2024 was the warmest year in the 175-year observational record, surpassing the previous warmest year, 2023 at 1.45 °C ± 0.12 °C above the pre-industrial 1850–1900 average.
- Each of the past 10 years, 2015-2024 were individually the ten warmest years on record for global mean temperature.
- Ocean heat content reached the highest level in 2024, the highest level in the 65-year observational record, surpassing the previous highest level in 2023.
- A new record for ocean heat content has been set each year, over the past 8 years.
- Over the past two decades, 2005-2024, the rate of ocean warming was more than twice that observed between 1960-2005.
- In 2024, the global mean sea level reached a record high in the satellite record (since 1993)
- In the past 10 years, 2015-2024, the rate of global mean sea-level rise was more than twice that observed between the first decade of the satellite record (1993-2002).
- The 18 lowest Arctic sea-ice extent minima all occurred in the past 18 years as per the satellite record.

In Ireland, extreme weather and climate events driven by global warming and climate change are also having major impacts.

[2] *Published 28th December 2023; updated 10th January 2024*

"*Ireland's Climate 2024 Provisional Summary Report"* published by Met Eireann[3], similarly reflects on clear and distinct impacts arising from climate change effects within an Irish context:

- 2024 was noted to be the fourth warmest year on record in Ireland with an average temperature of 10.72° C.
- 2024 was provisionally the 39th wettest year since 1941 with most primary stations recording below-average levels of annual rainfall.
- Further precipitation changes are expected, with a 9% potential decrease in the summer, causing water shortages and impacting agriculture, and a 24% potential increase in winter, elevating the risk of flooding in various regions.
- Seven named storms impacted Ireland in 2024, with Storms Isha and Darragh both producing particularly violent storm-force winds.

The Proposed Lifetime Extension will continue to support Ireland's ambition to reduce reliance on imported fossil fuels for electricity generation, which will in turn reduce the amount of GHGs being emitted into the atmosphere, limiting global warming.

2.3.1 International Climate Policy

United Nations Framework Convention on Climate Change

In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change (UNFCCC), as a framework for international efforts to combat the challenge posed by climate change. The UNFCCC seeks to limit average global temperature increases and the resulting climate change. In addition, the UNFCCC seeks to cope with impacts that are already inevitable. It recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other GHGs. The framework set no binding limits on GHG emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to set binding limits on GHGs.

Kyoto Protocol

The Kyoto Protocol operationalises the UNFCCC by committing industrialised countries and economies in transition to limit and reduce GHG emissions in accordance with agreed individual targets. Ireland is a Party to the Kyoto Protocol, which came into effect in 2005, and as a result of which, emission reduction targets agreed by developed countries are now binding.

In Doha, Qatar, on 8th December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

- New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1st January 2013 to 31st December 2020;
- A revised list of GHG to be reported on by Parties in the second commitment period; and
- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

Under the Protocol, countries must meet their targets primarily through national measures, although market-based mechanisms (such as international emissions trading) can also be utilised.

[3] *Ireland's Climate 2024 Provisional Summary Report (Met Eireann, March 2025)*

Conference of Parties (COP)

COP21 Paris Agreement

COP21 was the 21st session of the Conference of the Parties (COP) to the UNFCCC. Every year since 1995 (excluding 2020 due to COVID-19), the COP has gathered the 196 Parties (195 countries and the European Union (EU)) that have ratified the Convention in a different country, to evaluate its implementation and negotiate new commitments. COP21 was organised by the United Nations and held, in Paris, from 30th November to 12th December 2015. COP21 closed with the adoption of the first international climate agreement (concluded by 195 countries and applicable to all). The 12-page text, made up of a preamble and 29 articles, provides for a limitation of the global average temperature rise to well below 2°C above pre-industrial levels and to limit the increase to 1.5°C. It is flexible and takes into account the needs and capacities of each country. The IPCC's 6th Assessment Report (2021) further collaborates this need to limit any increase in global average temperature to 1.5°C, stating that,

> *"Humanity has emitted 2,560 billion equivalent tons of CO2 since 1750, and we only have a budget of 500 more if we want to limit warming to 1.5°C.*
>
> *By following a trajectory of very low GHG emissions (SSP1-1.9), the threshold of 1.5°C will be reached in the short term, between 2021 and 2040, before being very slightly exceeded (1.6°C anticipated over the period 2041-2060) then respected in the long term (1.4°C anticipated over the period 2081-2100).*
>
> *Everything is not lost, but we must pursue the Paris Agreement's most ambitious goal of limiting warming to 1.5°C."*

An article published by the IPCC on the 6th of October 2018 titled 'Global Warming of 1.5°C, notes the impacts of global warming of 1.5°C above pre-industrial levels and related global GHG emission pathways; in the context of mitigation pathways, strengthening of the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. This special report is part of an invitation contained in the Decision of COP21 of the UNFCCC to adopt the Paris Agreement and provides an update on the impact of climate change if emissions are not reduced.

COP25 Madrid

COP25, the 25th session of the COP, was held between the 2nd and 13th of December 2019 in Madrid. The conference was characterised by repeated warnings from civil society (NGOs and corporates) on emerging evidence and scientific consensus on climate change risk. Specifically, it was noted that there are only c. '*10 years left*' before the opportunity of limiting global warming to 1.5°C is no longer feasible. As such, the only remaining approach to limiting rising global temperatures is a '*7.6% reduction of global GHG emissions every year between 2020 and 2030, and to reach net zero emissions by 2050'*. However, consensus was not achieved between States on finalising the operating rules of the Paris Agreement and to ensure that it became operational by 2020. Three issues which emerged between States from the COP25 are summarised below:

- There was no uniform consensus between States to raise countries' climate ambitions, e.g. to make increased commitments in light of growing climate change data. Some States were opposed to imposing any obligation on countries to submit enhanced pledges by the following year, arguing it should be each country's own decision. All states were required to submit a review of their commitments for COP 26 in 2020. At the current level of climate targets, within a decade, the objective of the Paris Agreement will no longer be achievable;
- There was no agreement on finalising Article 6 of the Paris agreement, the foundations for international cooperation to combat climate change. The aim was to establish the rules for new international mechanisms for financing and transferring GHG emission reductions; and

- There was no agreement on financing (Green Climate Fund); specifically, relating to both loss and damage caused by climate change.

Despite the lack of consensus on the above challenges, the COP25 did achieve more limited success with regard to the introduction of the "*San Jose Principles for High Ambition and Integrity of International Carbon Markets*", which sets out the framework on which a robust carbon market should be built. These principles include, but are not limited to:

- Ensures environmental integrity and enables the highest possible mitigation ambition;
- Delivers an overall mitigation in global emissions, moving beyond zero-sum offsetting approaches to help accelerate the reduction of global GHG emissions;
- Prohibits the use of pre-2020 units, Kyoto units and allowances, and any underlying reductions toward Paris Agreement and other international goals; and
- Ensures that double counting is avoided and that all use of markets toward international climate goals are subject to corresponding adjustments.

These principles were supported by 23 EU, including Ireland, and Latin American countries, 5 no. Pacific Islands and 2 no. countries in the Caribbean.

COP26 Glasgow

COP26 took place in Glasgow, Scotland between the 31st October and 12th November 2021. The summit was centred around the fact that "*climate change is the greatest risk facing us all."* The UK, as hosts for the summit, have developed a ten-point plan to deliver a green industrial revolution, seeking to lead the world in tackling and adapting to climate change.

The key items COP26 sought to achieve are:

- Secure global net zero by mid-century and keep 1.5 degrees within reach;
- Adapt to protect communities and natural habitats;
- Mobilise finance; and
- Work together to deliver.

All world leaders at the summit confirmed the need to urgently address the gaps in ambition and work together to achieve climate action.

The summit highlighted that the Paris Agreement is working, with leaders outlining national targets and efforts to further reduce emissions. There was a clear commitment to working together to achieve climate aims, with significant announcements including:

- *Over 40 leaders joined the Breakthrough Agenda, a 10-year plan to work together to create green jobs and growth globally, making clean technologies and solutions the most affordable, accessible and attractive option before 2030 – beginning with power, road transport, steel, hydrogen and agriculture.*
- *Over 120 countries covering more than 90% of the world's forests endorsed the Glasgow Leaders' Declaration on Forests & Land Use committing to work collectively to halt and reverse forest loss and land degradation by 2030, backed by the biggest ever commitment of public funds for forest conservation and a global roadmap to make 75% of forest commodity supply chains sustainable.*
- *A Just Energy Transition Partnership was announced to support South Africa's decarbonisation efforts; a powerful example of collaboration between an emerging economy and international partners.*
- *The launch of the Global Methane Pledge saw over 100 countries committing collectively to reduce global methane emissions by 30% by 2030."*

COP27 Egypt

COP27 took place in Sharm el-Sheikh from the 6th of November to the 20th of November 2022. The COP is a supreme decision-making body of the UNFCCC. COP 27 centred around three major topics:

- Closing the emissions gap to keep 1.5°C alive
- Loss and Damage
- Climate Finance

COP27 officially ended on the 18th of November, but due to the nature of negotiations an outcome text and the final press conference was not held until November 20th. The first outcomes of the negotiations of the COP27 agenda were seen in the first draft document. A consolidated final document followed and while it removed much of the vague wording of the draft, it also removed some critical key points, particularly in relation to the strengthening of actions required by developed nations. The most significant outcomes from COP27 are outlined below:

- Phase down/out language: The final agreement contains a commitment to a 'phase down' of coal use, as opposed to a wider commitment to phase out all fossil fuels.
- 1.5°C Pathway: The 1.5°C warming limit has been retained and reassurances have been made that there is no room for backsliding.
- Climate Finance & Loss and Damage: There has been the launch of an initiative by the V20 and G7 known as the Global Shield Against Climate Risk (GSACR). The intention of this initiative has been framed almost as an insurance policy backed by the World Bank to prepare and protect those most vulnerable to climate change disasters.

COP28 United Arab Emirates

The 28th session of the COP to the UNFCCC, was held in Dubai from 30 November to 13 December 2023. The main objective of COP was to assess the progress made by all parties on the implementation of the 2015 Paris Agreement through the concluding phase of the 'global stocktake', which began after COP26 in 2021.

A key outcome from COP28 was the agreement to phase out fossil fuels and increase renewable energy capacity. The agreement calls for a tripling of renewable energy capacity globally by 2030. This was the first time that the COP explicitly addressed the need to end the use of fossil fuels. The agreement was signed by the Irish Government among 116 other nations. The acceleration of the permitting of renewable projects and related infrastructure is identified as a crucial enabler to achieve the renewable energy targets set out under the agreement.

COP29 Azerbaijan

COP29 took place in Baku, Azerbaijan between the 11th and 22nd of November 2024. There was a central focus on climate financing with agreements being reached on tripling finance to developing countries to help them protect their people and economies from climate-related disasters and also sharing the benefits of the boom in renewable energy. Key actions arising from COP29 include:

- Launch of the COP29 Global Energy Storage and Grids Pledge which commits signatories to a collective goal of deploying 1,500 GW of energy storage globally by 2030.
- COP29 Green Energy Pledge: Green Energy Zones and Corridors which promotes the connection of green energy zones and corridors to communities in need through the development of intraregional and interregional interconnected electricity grids.
- Call to action for an equitable and renewable energy transition, and increased renewable energy capacity globally.

Progress was also made on carbon markets and how they will operate under the Paris Agreement. Article 6 of the Paris Agreement allows countries to trade carbon credits, which are produced through reducing GHG emissions, to support other countries to meet their climate goals. Country-to-country

trading and a carbon crediting mechanism have been made fully operational through agreements at COP29.

European Green Deal – European Climate Law (2021)

The European Green Deal, initially introduced by the European Commission in December 2019, sets out the 'blueprint' for a transformational change of the 27-country bloc from a high- to a low-carbon economy, without reducing prosperity and while improving people's quality of life, through cleaner air and water, better health and a thriving natural world. The Green Deal is intended to work through a framework of regulation and legislation setting clear overarching targets, e.g. a bloc-wide goal of net zero carbon emissions by 2050 and a 55% cut in emissions by 2030 (compared with 1990 levels). This is a substantial increase compared to the existing target, upwards from the previous target of at least 40% (2030 Climate & Energy Framework), and furthermore, these targets demonstrate the ambition necessary to keep the global temperature increase to well below 2°C and pursue efforts to keep it to 1.5°C as per the Paris Agreement. With regard to the energy sector, the Green Deal focuses on 3 no. key principles for the clean energy transition, which will help reduce GHG emissions and enhance the quality of life for citizens:

- Ensuring a secure and affordable EU energy supply;
- Developing a fully integrated, interconnected and digitalised EU energy market; and
- Prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources (e.g. the subject development)

The European Climate Law writes into law the objectives set out above in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. Climate neutrality by 2050 means achieving net zero GHG emissions for EU countries as a whole, mainly by cutting emissions, investing in green technologies and protecting the natural environment. The Climate Law includes:

- A legal objective for the Union to reach climate neutrality by 2050;
- An ambitious 2030 climate target of at least 55% reduction of net emissions of GHGs as compared to 1990, with clarity on the contribution of emission reductions and removals;
- A process for setting a 2040 climate target, taking into account an indicative GHG budget for 2030-2050 to be published by the Commission;
- A commitment to negative emissions after 2050;
- The establishment of European Scientific Advisory Board on Climate Change, that will provide independent scientific advice;
- Stronger provisions on adaptation to climate change; and
- Strong coherence across Union policies with the climate neutrality objective

The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part. All 27 no. EU Member States have committed to turning the EU into the first climate neutral continent by 2050. One third of the 1.8 trillion-euro investments from the Next Generation EU Recovery Plan, and the EU's seven-year budget, will finance the European Green Deal. On 14th July 2021, the European Commission adopted a set of proposals[5] to make the EU's climate, energy, transport and taxation policies fit for reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels.

Achieving these emission reductions in the next decade is crucial to Europe becoming the world's first climate-neutral continent by 2050. This milestone will only be achieved through the permitting and construction or continued operation of renewable energy projects, such as the Proposed Lifetime Extension.

2.3.1.2 Proposed Lifetime Extension - Compliance with International Climate Policy

From the review of the relevant policy documents, it is considered that the proposal to extend the operational life of the existing Taurbeg Wind Farm will continue to reduce our reliance on fossil fuels for electricity generation, therefore being wholly in line with the goals of the UNFCCC to limit global temperatures as a result of climate change and the goals of the Kyoto Protocol and the several COP agreements as outlined above.

Goals set out in the European Green Deal – to reach net zero carbon emissions by 2050 – will fail to be achieved if proposals, such as that under consideration here, are not implemented. The continued operation of the wind farm also will aid in ensuring energy security within the EU which is a target of the European Green Deal. As wind is an indigenous and abundant resource, countries can tap into their own wind potential, reducing the vulnerability to price fluctuations and geopolitical risks associated with fossil fuel imports.

2.3.2 National Climate Policy

Programme for Government – Securing Ireland's Future (January 2025)

The Programme for Government 2025 – Securing Ireland's Future (January 2025) places specific emphasis on climate change, recognising that time is critical in addressing the climate crisis. The Programme states that the Government is committed to taking *"decisive action to radically reduce our reliance on fossil fuels and to achieve a 51% reduction in emissions from 2018 to 2030, and to achieving net-zero emissions no later than 2050".*

With regard to renewable energy generation, the Programme notes that the Government is committed to the rapid decarbonisation of the energy sector. The Programme states the Government's ongoing support and commitment to "*achieving 80% of Ireland's electricity generation from renewable sources by 2030"* and to delivering 9GW of onshore wind by 2030.

The Climate Action and Low Carbon Development Act 2015 (as amended)

The Climate Action and Low Carbon Development Act 2015 (as amended) ("the Climate Act") legally binds Ireland to achieve net-zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade.

The Climate Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change. As indicated by the premise of the legislation, the reduction of emissions is a key proponent of the Climate Act and incorporates the following key provisions:

- Embeds the process of setting binding and ambitious emissions-reductions targets in law;
- Provides for a national climate objective, which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy;
- Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% over the period to 2030, relative to a baseline of 2018;
- The role of the Climate Change Advisory Council has been strengthened;
- The Government must adopt carbon budgets that are consistent with the Paris agreement and other international obligations;
- Actions for each sector will be detailed in the Climate Action Plan which must be updated annually.

A recent judgement of the High court delivered on 10th January 2025, provides clarity on the obligations imposed on public bodies under section 15 of the Climate Act (*Coolglass Wind Farm Limited v An Bord Pleanála [2025] IEHC 1*).

Mr Justice Humphreys undertook a detailed consideration of the interpretation of Section 15 of the Climate Act and concluded that, when deciding upon an application relevant to the achievement of climate plans and objectives under Section15 of the Climate Act, relevant bodies, in this case the Planning Authority, is required to:

1. Consider if the application, if granted, would contribute to achieving climate targets? In the case of renewable energy projects, the answer is invariably yes.
2. Consider whether granting permission is *"precluded by a mandatory and non-fixable legal requirement"* that does give the decision maker any flexibility in reaching an outcome favouring climate goals, i.e. a grant of permission.
3. If the decision maker is not precluded from granting permission, then how can the planning authority use its evaluative judgement and discretion to reach an outcome favouring policy goals.

As part of Mr Justice Humphrey's consideration of the interpretation of Section 15 of the Climate Act, he states in his judgement that "*an immediate end to business as usual is a precondition for planetary survival*".

In summary, Section 15 of the Climate Act requires relevant bodies to engage in its own independent consideration of the impact of a proposed development on the State achieving its climate targets and to exercise its discretion in a manner which supports the achievement of those targets.

It should be noted that on the 20th of May 2025, the Supreme Court granted An Coimisiún Pleanála (formerly An Bord Pleanála) leave to appeal the High Court's decision in the Coolglass case.

The existing Taurbeg Wind Farm contributes to a reduction in emissions, and therefore already serves as an important project in national terms. The proposal to continue its operation is therefore consistent with binding emissions reduction targets at both a European and National level.

Carbon Budgets

To achieve the 51% emissions reduction target, the Climate Act requires the Climate Change Advisory Council (CCAC) to recommend a proposed programme of economy-wide 5-year Carbon Budgets to the Minister for the Environment, Climate and Communications. The first national carbon budget programme proposed by the Climate Change Advisory Council, approved by Government and adopted by both Houses of the Oireachtas in April 2022 comprises three successive 5-year carbon budgets[4]. The total emissions allowed under each budget are shown in Table 2-2 below.

Table 2-2: Carbon Budgets of the Climate Change Advisory Council

	2021 – 2025 Carbon Budget 1	2026 – 2030 Carbon Budget 2	2031 – 2035 Provisional Carbon Budget 3
	All Gases		
Carbon Budget (Mt CO_2eq)	295	200	151
Annual Average Percentage Change in Emissions	-4.8%	-8.3%	-3.5%

[4] *Climate Change Advisory Council Carbon Budget Technical Report (October 2021)* https://www.gov.ie/en/publication/9af1b-carbon-budgets/

	2021 – 2025 Carbon Budget 1	2026 – 2030 Carbon Budget 2	2031 – 2035 Provisional Carbon Budget 3
The figures are consistent with emissions in 2018 of 68.3 Mt CO_2eq reducing to 33.5 Mt CO_2eq in 2030, thus allowing compliance with the 51% emissions reduction target by 2030.			

Section 6C of the Climate Act provides that the Minister shall prepare, within the limits of the carbon budget, the Sectoral Emissions Ceilings. These ceilings set out the maximum amount of GHG emissions that are permitted in each sector. The Government approved Sectoral Emissions Ceilings on 28 July 2022. The electricity sector is allocated a sectoral ceiling of 40 Mt CO2 eq for the first budget (2021-2025) and a sectoral ceiling of 20 Mt CO2 eq for the second budget period (2026-2030). In 2022, the electricity sector emissions were 10.1 Mt CO2 eq[5].

The Environmental Protection Agency (EPA) reported in May 2024[6] that the first two carbon budgets (2021-2030) – which aim to support achievement of the 51% emissions reduction target - would not be met, and by a significant margin of between 17 and 27 per cent.

Climate Action Plan 2023

The Climate Action Plan 2023 ('CAP23') was published in December 2022 by the Department of the Environment, Climate and Communications (DECC). This outlines the actions required to 2035 and beyond to meet Ireland's commitment to becoming carbon neutral by 2050. CAP23 sets out a roadmap to deliver on Irelands climate ambition and is aligned to ensure that Ireland achieves its legally binding target (the Climate Action and Low Carbon Development (Amendment) Act 2021) of net-zero GHG emissions no later than 2050. A target aims for a reduction in emissions of 51% over the period 2018 to 2030 and in doing so, prevent / mitigate the potentially devastating consequences of climate change on Ireland's environment, society, economic and natural resources.

The CAP23 states that to do so, Ireland must harness the untapped indigenous renewable resources and has a target of achieving 80% of energy being produced from renewable sources by 2030 (unchanged from the previous Climate Action Plan, 2022) with a target of 9GW of that being produced by onshore wind. Measures set out in CAP23 to achieve these targets include to 'accelerate and increase the deployment of renewable energy to replace fossil fuels' (Section 12.1.4 CAP23). It is clear from the message and ambition of CAP23 that the drive to deploy renewable energy projects such as the Proposed Project in Ireland are critical to achieving the aims and objectives of CAP23 including the 9GW of onshore wind energy by 2030 and carbon neutrality by 2050.

> *"Achieving these ambitions will require a coordinated effort across Ireland and every economic sector will be involved. It requires no less than a national transformation over the coming years in how we work, travel, heat our homes, source our energy and use our land".*
>
> *"Decarbonisation of the electricity sector is, as noted in CAP23, key to the decarbonisation of other sectors who will depend on electrification including transport, heating and industry. The increase in portion of renewable electricity of 80% by 2023 will come in part from a targeted 9GW of onshore wind. The plan notes: "Achieving further emissions reductions between now and 2030 requires a major step up in how we accelerate and increase the deployment of renewable energy to replace fossil fuels, deliver a flexible system to support renewables, and manage electricity demand".*

Chapter 11 sets out the state of play, targets and actions for the decarbonisation of the Electricity sector. Carbon emissions from electricity have fallen by 45% between 2005 and 2020; a trend largely due to the

[5] *Climate Change Advisory Council Annual Review 2023 (July 2023) https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC-AR-2023-postfinal.pdf*
[6] *https://www.epa.ie/news-releases/news-releases-2024/ireland-is-projected-to-exceed-its-national-and-eu-climate-targets.php*

availability of renewable energy generated electricity (a sixfold increase between 2005 and 2020) and an associated reduction in the use of carbon heavy fuels such as peat and coal.

Due to the scale of the challenge at hand however, and the recognition of the key role of the electricity sector in achieving sector wide targets, the electricity sector has been allocated the smallest carbon budget and will require the steepest carbon emissions decline of all sectors – namely a reduction in carbon emission by -75% relative to 2018 baseline. Carbon budgets 1 and 2 allow for 40.02 MtCO2eq from the electricity sector up to 2025 and 20 MtCO2eq. from 2026-2030. The SEAI report in their 'First Look: Mid-Year Review of Ireland's Energy and Related Emissions in 2024' publication covering the period January to June 2024 that *"If SEAI's estimate of electricity emissions in the first 6-months of 2024 remains representative of the subsequent 18-months, then the total emissions from the electricity sector in the 5-year period of the first carbon budget will sum to approximately 41 MtCO2e. This would be approximately 1 MtCO2e over the 40 MtCO2e sectoral emission ceiling allowed for electricity to the end of 20251. If this result eventuated, then the sectoral emission ceiling for electricity in the second carbon budget (2026 – 2030) would be limited to 19 MtCO2e. Staying within the second carbon budget would require average electricity sector emissions of no more than 3.8 MtCO2e per year (the average for the first 3-years of the first carbon budget was 9.1 MtCO2e per year)."*

The measures set out for the electricity sector include *inter alia*:

- Reduce annual CO2eq. emissions from the sector to 3 MtCO2eq by 2031 (75% reduction compared to 2018);
- Accelerate and increase the deployment of renewable energy to replace fossil fuels;
- Accelerate the delivery of onshore wind, offshore wind and solar through a competitive framework to reach 80% of electricity demand from renewable energy by 2030;
- Target 6GW of onshore wind and up to 5 GW of solar by 2025;
- Target 9 GW onshore wind, 8 GW Solar and at least 5 GW of offshore wind by 2030;
- Align the relevant constituent elements of the planning and permitting system to support accelerated renewable energy development, supported by national policy and associated methodologies to inform regional and local planning policies, noting that Development Plans are obliged to set out objectives to facilitate energy infrastructure;

Having regard to the targets and measures set out above, it is clear that in the context of more requiring to be done in the climate change sector, a project which already has the benefit of being operational and is already contributing to the active reduction in carbon emissions, such as the Proposed Lifetime Extension, must be considered favourably.

Climate Action Plan 2024

The Climate Action Plan 2024 ('CAP24') builds on CAP23 by refining and updating the status of the actions required to deliver the decarbonisation required under the carbon budgets and sectoral emissions ceilings. The renewable electricity generation targets are unchanged from the CAP23 (9GW of onshore wind & 80% renewable electricity share).

CAP24 includes the latest trends in the electricity sector:

- In 2022, renewable generation accounted for 38.6% of electricity, an increase from 35% in 2021.
- Electricity accounted for 14.4% of Ireland's GHG emissions in 2022.
- To meet the first carbon budget the electricity sector requires a decarbonisation rate of 17.3% per annum in the period 2023-2025. For context, the decarbonisation rate between 2018 and 2022 was 1.4% per annum.

CAP24 acknowledges the urgency and importance of the decarbonising the electricity sector. The plan states:

> *"Given that the programme of large-scale offshore wind deployment is expected to be realised towards end decade, deployment rates for onshore renewables will need to increase to match demand growth to ensure we keep electricity emissions within range of the carbon budgets. This requires a major upscaling and accelerating in current deployment of renewables, particularly onshore wind."*

The scale of the challenge is apparent when quantified:

> *"As an example, the historical average deployment of onshore wind installed capacity connected between 2008 and 2020 inclusive was ~280 MW per annum from 19 projects (with an annual maximum of 612 MW). To achieve the necessary emissions abatement, an approximately eight-times increase of renewable energy deployment* ***to 2.3 GW annually*** *would be needed* ***between 2024 and 2030****."*

CAP 24 identifies the alignment of local and national policy as a critical to accelerate renewable energy rollout.

> *"greater alignment between local plans and renewable energy targets at national and regional level to support investment in and delivery of onshore wind and solar renewable energy is also critical".*

Having regard to the targets and measures set out above, it is clear that there is strong climate policy support for the provision of renewable energy generators, such as the Proposed Lifetime Extension.

Climate Action Plan 2025

The Climate Action Plan 2025 (CAP25) represents the third statutory update to Ireland's climate roadmap under the Climate Act. Building on the foundations laid by previous plans, CAP25 refines and strengthens the strategies necessary to deliver Ireland's legally binding carbon budgets and sectoral emissions ceilings. It sets out a clear trajectory to reduce GHG emissions by 51% by 2030 and to achieve climate neutrality no later than 2050.

A cornerstone of CAP25 is the decarbonisation of Ireland's electricity system through a substantial increase in renewable energy generation. The plan reaffirms ambitious targets for renewable electricity share which includes 80% by 2030, and 50% by 2025. This is to be achieved through the accelerated deployment of onshore wind (6GW by 2025; 9GW by 2030), offshore wind (5GW by 2030), and solar energy (up to 5GW by 2025; 8GW by 2030).

CAP25 recognises that the extension of life of onshore wind energy developments (e.g. the Proposed Lifetime Extension) is critical to ensuring that the target of 80% renewable electricity by 2030 is achieved. The plan states that "*extending the life of and/or repowering existing renewable electricity projects offers an efficient use of established infrastructure and minimises the risk to the security of electricity supply at a time when increasing numbers of existing windfarms are reaching the end of their life*."

As an existing wind farm with established infrastructure and an existing connection to the national electricity grid, the extension of operational life of the Taurbeg Wind Farm accords with the provisions of CAP25. The Proposed Lifetime Extension will continue to contribute to the current installed capacity of 5GW for onshore wind energy, contributing to the achievement of 80% renewable energy and the delivery of 9GW of onshore wind by 2030.

The Proposed Lifetime Extension will continue to offset Ireland's reliance on imported fossil fuels for electricity generation and contribute to energy security by generating indigenous renewable wind energy.

2.3.2.2 Proposed Lifetime Extension - Compliance with National Climate Policy

The existing Taurbeg Wind Farm is operational and has been since 2006 when it was commissioned. The wind farm has therefore been generating renewable electricity and supplying to the national grid for a period of more than 19 years. The Proposed Lifetime Extension will therefore aid in the overall supply of renewables in the country, therefore it will directly serve to continue generating energy onto the national grid without the need to take account of any construction phase. The renewable energy produced, will help Ireland address the challenge of decarbonising electricity generation as well as addressing the country's over-dependence on imported fossil fuels. Therefore, it is considered that the Proposed Lifetime Extension is in compliance with climate policy.

2.4 Renewable Energy Policy and Targets

2.4.1 European Renewable Energy Policy

Renewable Energy Directive I & II

The Renewable Energy Directive is the EU legal framework for the development of renewable energy across all sectors of the EU economy, supporting clean energy cooperation across EU countries. Since the introduction of the Renewable Energy Directive (RED) in 2009, it has undergone several revisions since then. Since its adoption in 2009, the share of renewable energy sources in energy consumption has increased from 12.5% in 2010 to 23% in 2022. Of the 27 EU member states the lowest proportion of renewable energy in gross final energy consumption was recorded in Ireland (13.1%). Crucially, the Renewable Energy Directive sets the overall target for renewable energy in the EU.

RED I - 2009

Renewable Energy Directive 2009 (RED I - the original RED) (2009/28/EC), adopted in 2009, set binding targets for EU member states to achieve a 20% share of renewable energy in final energy consumption by 2020. It established a framework for national renewable energy action plans, sustainability criteria for biofuels and bioliquids, and a system of guarantees of origin for renewable energy.

RED II – 2018

RED II, the first major amendment to the RED, (2018/2001/EU) entered into force in December 2018, as part of the Clean Energy for all Europeans package. In RED II, the overall EU target for Renewable Energy Sources consumption by 2030 was raised to 32%. RED II is currently in force and applies to the present application and EIA. Given the transposition deadline has passed, the provisions of RED II are now binding on the State and public authorities, including local authorities and An Coimisiún Pleanála.

Repowering is defined in RED II as "***renewing*** *power plants that produce renewable energy,* ***including*** *the full or partial replacement of installations* ***or*** *operation systems and equipment for the purposes of replacing capacity or increasing the efficiency or capacity of the installation*". (Emphasis added).

Article 16(6) states that Member States shall facilitate the repowering of existing renewable energy plants by ensuring a simplified and swift permit-granting process. The length of that process shall not exceed one year.

REPowerEU Plan

The European Commission has proposed an outline of a plan to make Europe independent from Russian fossil fuels including oil and gas, due to the high and volatile energy prices, and security of supply concerns following Russia's unprecedented military attack on Ukraine. At the time of publication, the EU imported 90% of its gas consumption, with Russia providing around 45% of those inputs. Russia also accounted for around 25% of oil and 45% of coal imports. Phasing out dependence on fossil fuels can be done well before 2030, increasing the resilience of the EU-wide energy system based on two pillars:

1. *Diversifying gas supplies, via higher Liquefied Natural Gas (LNG) and pipeline imports of biomethane and renewable hydrogen production and imports from non-Russian suppliers.*
2. *Reducing faster the use of fossil fuels by boosting energy efficiency, increasing renewables and addressing infrastructure bottlenecks.*

With full implementation of the measures in REPowerEU plan, at least 155 bcm of fossil gas use could be removed, which is equivalent to the volume imported from Russia in 2021. Nearly two thirds of that reduction can be achieved within a year. A part of this plan includes 'Speeding up renewables permitting to minimise the time for roll-out of renewable projects and grid infrastructure improvements'. This will make the sector more efficient and reach the set goals faster.

Regulation 2022/2577

In recognition of the worsening energy crises arising from Russia's war against Ukraine, the Council of the European Union adopted Regulation (EU) 2022/2577 on 22 December 2022, 'Laying down a framework to accelerate the deployment of renewable energy.' This regulation, which has immediate and direct effect in Member States, applies to "all permit-granting processes that have a starting date within the period of its application" and includes a number of tangible measures aimed at streamlining the permit-granting process and facilitating the accelerated deployment of renewable energy. The period of application of the Regulation was an 18 month period from the 30 December 2022 to 29 June 2024.

> *'A fast deployment of renewable energy sources can help to mitigate the effects of the current energy crisis, by forming a defence against Russia's actions. Renewable energy can significantly contribute to counter Russia's weaponisation of energy by strengthening the Union's security of supply, reducing volatility in the market and lowering energy prices.'*

Central to the Regulation is the presumption that renewable energy development must be considered to be in the overriding public interest when addressing competing interests under the Habitats Directive (92/43/EEC), Birds Directive (2009/147/EEC) and the Water Framework Directive (2006/60/EC) and that renewable energy projects should be given priority when balancing legal interests in a given case – Article 3:

1. *'The planning, construction and operation of plants and installations for the production of energy from renewable sources, and their connection to the grid, the related grid itself and storage assets **shall** be presumed as being in the overriding public interest and serving public health and safety when balancing legal interests in the individual case, for the purposes of Article 6(4) and Article 16(1)(c) of Council Directive 92/43/EEC, Article 4(7) of Directive 2000/60/EC of the European Parliament and of the Council and Article 9(1)(a) of Directive 2009/147/EC of the European Parliament and of the Council....'*
2. *'Member States shall ensure, at least for projects which are recognised as being of overriding public interest, that in the planning and permit-granting process, the construction and operation of plants and installations for the production of energy from*

> *renewable sources and the related grid infrastructure development are given priority when balancing legal interests in the individual case....* (emphasis added)*'*

The Regulation was introduced as a temporary, emergency measure and included provision for the EU Commission to review the application of, and continued need for, the measures included in the Regulation. The Commission completed its review of the Regulation and furnished its report to the Council on the 28 November 2023. In its report the Commission recommended the prolongation of the validity of certain measures in the Regulation, including Article 3(2), and by Regulation 2024/223 of the 22 December 2023 the Council of the European Union, Regulation 2022/2577 was passed which extends the life of certain provisions of the Regulation beyond June 2024 to 30 June 2025 and makes a number of amendments. The amended Regulation applies to the present application and EIA.

Article 3(2) requires priority to be given to renewable energy projects that are recognised as being of overriding public interest whenever the balancing of legal interests is required in individual cases.

The importance, continued need and effectiveness of Article 3(2) of Regulation 2022/2577 in aiding the accelerated deployment of renewable energy is explained in Recital 14 of Regulation 2024/223:

> *'...Article 3(2) of Regulation (EU) 2022/2577 requires priority to be given to projects that are recognised as being of overriding public interest whenever the balancing of legal interests is required in individual cases and where those projects introduce additional compensation requirements for species protection... The first sentence of Article 3(2) of Regulation (EU) 2022/2577 has the potential, in the current urgent and still unstable energy situation on the energy market which the Union is facing, to further accelerate renewable energy projects since it requires Member States to promote those renewable energy projects by giving them priority when dealing with different conflicting interests beyond environmental matters in the context of Member States' planning and the permit-granting process. The Commission's report demonstrated the value of the first sentence of Article 3(2) of Regulation (EU) 2022/2577 which recognises the relative importance of renewable energy deployment in the current difficult energy context beyond the specific objectives of the derogations foreseen in the Directives referred to in Article 3(1) of Regulation (EU) 2022/2577. Given the particularly severe situation in the supply of energy which the Union is currently facing, it is appropriate to prolong the application of Article 3(2) of Regulation (EU) 2022/2577 in order to appropriately recognise the crucial role played by renewable energy plants to fight climate change and pollution, reduce energy prices, decrease the Union's dependence on fossil fuels and to ensure the Union's security of supply in the context of the balancing of legal interests carried out by permit-granting authorities or national courts. At the same time, it is also appropriate to keep the environmental safeguard that, for projects recognised as being of overriding public interest, appropriate species conservation measures, underpinned by sufficient financial resources, are adopted. (emphasis added)'.*

This provision is currently in force under the original Regulation and the amended version is binding on the State under the Amended Regulation from 1 July 2024 to 30 June 2025.

It is submitted that the continued operation of the Taurbeg Wind Farm is strongly supported by EU energy policy. Many of the measures outlined in REPowerEU have been incorporated into national Policy through the National Energy Security Framework, which was published by the Government in April 2022, and discussed in further detail in Section 2.4.1.

Renewable Energy Directive III

RED III – 2023

In November 2023, a revision of the Renewable Energy Directive (RED III), came into force. RED III increases the EU wide renewable energy target from 32% set under the previous revision of the directive

to 42.5%, with an ambition to reach 45% by 2030. The increase was proposed under the publication of the REPowerEU plan in May 2022. The Directive also introduces specific targets for Member States in the industry, transport, and building (district heating and cooling) sectors.

Under RED III, EU Member States must identify areas for the acceleration of renewables where projects will undergo a simplified and fast-track procedure.

Article 16f puts the presumption that renewable energy development must be considered to be in the overriding public interest on a permanent footing. It states that by 21 February 2024 and until climate neutrality is achieved, Member States shall ensure that in the permit granting procedure, the planning, construction and operation of renewable energy plants are presumed as being in the overriding public interest and serving public health and safety when balancing legal interests for the purposes of the Habitats Directive, the Water Framework Directive and the Birds Directive.

These measures came in response to REPowerEU which found that permitting is the biggest bottleneck for deploying wind at scale, with approximately 80 GW of wind power capacity stuck in permitting procedures across Europe. In September 2024 the European Commission opened infringement procedures against Ireland and 25 other Member States for failing to fully transpose the provisions of the revised Renewable Energy Directive relating to the simplification and acceleration of permitting procedures. In response to Oireachtas questioning on the matter, the Minister for the Environment, Climate and Communications noted "*Ireland is supportive of efforts to reduce overall permitting timelines for renewable energy projects. However, the scale and complexity of changes necessary to implement these provisions requires an extensive programme of work. Efforts to reduce permitting timelines have been underway, in this context, for some time. This programme of work includes legislative changes to the planning system to meet the RED III requirements. These are being advanced by the Department of Housing, Local Government and Heritage and the drafting of a Statutory Instrument under the European Communities Act 1972 is at an advanced stage. This SI will amend the Planning and Development Act, as amended, and the Planning and Development Regulations, as amended.*"

At Recital 38 it is acknowledged that *"repowering of existing renewable energy power plants has significant potential to contribute to the achievement of the renewable energy targets" and entails "further benefits such as the existing grid connection, a likely higher degree of public acceptance and knowledge of the environmental impact.".* (Emphasis added)

Article 16b(2) also states that "*Where a renewable energy project has adopted necessary mitigation measures, any killing or disturbance of the species protected under Article 12(1) of [the Habitats] Directive 92/43/EEC and Article 5 of [the Birds] Directive 2009/147/EC shall not be considered to be deliberate.*" (Emphasis added).

The deadline for transposition of this Directive is 21 May 2025. However, an earlier deadline of 1 July 2024 applies under the Emergency Regulation 2022/2577 and applies to the present application and EIA.

Energy Roadmap 2050

The *Energy Roadmap 2050* was published by the European Commission in 2011 and analyses the transition of the contemporary energy system in ways that would be compatible with the GHG reductions targets as set out in the Renewable Energy Directive (Directive 2009/28/EC) while also increasing competitiveness and security of supply. To achieve these targets and objectives, the Roadmap states that significant investments will need to be made in new low-carbon technologies and renewable energy, e.g. wind energy infrastructure, energy efficiency and grid infrastructure. Five main routes are identified to achieving a more sustainable, competitive and secure energy system in 2050:

- High Energy Efficiency;
- Diversified Supply Technologies;

- High Renewable Energy Sources;
- Nuclear energy; and
- Carbon capture and storage.

The analysis found that decarbonising the energy system is technically and economically feasible. The Roadmap notes that all scenarios show the biggest share of energy supply technologies in 2050 comes from renewables. In this regard, it should be noted that the Climate Change Advisory Council states within their 2024 Annual Review that "progress to reduce emissions is not sufficient for Ireland to meet its national and EU climate obligations. Reliance on fossils fuels needs to end, and urgent action is required to ensure that people, places and nature can adapt to the changing climate and prepare for rapidly emerging climate risks. The current rate of policy implementation is too slow and fragmented, and more effective engagement across all segments of policy and society is required to empower sustainable decision-making and to understand and remove barriers to action." As such, a major prerequisite for a more sustainable and secure energy system is a higher share of renewable energy up to and beyond 2030 to 2050. Each of the scenarios assumes in the analysis that increasing the share of renewable energy and using energy more efficiently are crucial, irrespective of the particular energy mix chosen.

2.4.1.2 Proposed Lifetime Extension - Compliance with European Renewable Energy Policy

At a European level, there is a clear upward trend in the revisions of renewable energy targets. With a current target of 42.5%, with an ambition to reach 45% by 2030, it is crucial that every existing renewable energy generator is retained where possible. The existing Taurbeg Wind Farm currently contributes to the 23% of energy currently sourced from renewable energy.

2.4.2 National Renewable Energy Policy

White Paper on Ireland's Transition to a Low Carbon Energy Future 2015-2030

On 12th May 2014, the Green Paper on Energy Policy in Ireland was launched which marked the start of a public consultation process on the future of Ireland's energy policy over the medium to long-term. The Department of Communications, Climate Action & Environment acknowledged that energy is an integral part of Ireland's economic and social landscape and that *"a secure, sustainable and competitive energy sector is central to Ireland's ability to attract and retain Foreign Direct Investment and sustain Irish enterprise. The three key pillars of energy policy are to focus on security, sustainability and competitiveness"*

Following on from an extensive consultation process, a Government White Paper entitled *'Ireland's Transition to a Low Carbon Energy Future 2015-2030'* was published in December 2015 by the (then) Department of Communications, Energy and Natural Resources (DCENR). This Paper provided a complete energy update and a framework to guide policy up to 2030. The Paper builds upon the White Paper published in 2007 and takes into account the changes that have taken place in the energy sector since 2007.

The policy framework was developed to guide policy and actions that the Irish Government intends to take in the energy sector up to 2030 and also reaching out to 2050 to ensure a low carbon future that maintains Ireland's competitiveness and ensures a supply of affordable energy. The Energy Vision 2050, as established in the White Paper, describes a '*radical transformation'* of Ireland's energy system which will result in GHG emissions from the energy sector reducing by between 80% and 95%, compared to 1990 levels. The Paper advises that a range of policy measures will be employed to achieve this Vision with emphasis on the generation of electricity from renewable sources, which there are plentiful indigenous supplies and increasing the use of electricity and bio energy to heat homes and fuel transport.

In this White Paper, the DCENR acknowledges that onshore wind is one of the cheapest forms of renewable energy in Ireland, stating that:

> *"Onshore wind continues to be the main contributor (18.2% of total generation and 81% of RES-E in 2014). It is a proven technology and Ireland's abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support."*

National Energy Security Framework

The Framework (DECC, April 2022) highlights clearly the impacts the Russian invasion of Ukraine and the resulting war has had on Europe's energy system. The resulting decision by the EU to phase out the import of Russian gas, oil and coal (REPowerEU) has brought to the fore the importance of security of supply and how energy policy is designed for long-term resilience. It takes account of the need to decarbonise society and economy, to reduce Ireland's emissions by 51% over the decade to 2030 and reach net zero emissions by 2050. According to the SEAI's Energy in Ireland (2024) report, 55.6% of all energy consumed in Ireland was oil products, mainly diesel, petrol, and heating oils.

The International Energy Agency, of which Ireland is a member country, includes a 10-point plan to cut oil use which calls for an acceleration in the deployment of wind and solar projects. Ireland's response per the Framework is set out over three themes:

- Theme 1 – managing the impact on consumers and businesses
- Theme 2 – ensuring security of energy supply in the near-term
- Theme 3 – reducing our dependency on imported fossil fuels in the context of the phasing out of Russian energy imports across the EU

In relation to theme 3, the Framework highlights that replacing fossil fuels with renewables, including wind energy, will be a focus area of work. The Framework calls for "*Supportive policies across Government and State agencies"* which "*can reduce barriers and fast track permitting for renewable energy generation projects. Similarly, renewable energy developers need to match this through taking a leadership role in delivering high quality applications to relevant consenting authorities, meeting project milestones on time and minimising delays.*" There are a number of 'Responses' set out in the Framework aimed at reducing reliance on imported fossil fuels and increasing indigenous renewable energy generation, including Response 25 which seeks the alignment of all elements of the planning system to support accelerated renewable energy development.

Having regard to the above, it is clear that the provision of renewable energy, such as the electricity produced by the existing Taurbeg Wind Farm, is vital in helping to secure the State's energy supplies and reduce reliance on imported fossil fuels.

Energy Security in Ireland to 2030 – Energy Security Package

Published in November 2023, the energy security package builds on the policies set out in the NESF. The energy security package is based on the recognition of the following fact:

> *"Ireland's future energy will be secure by moving from an oil-, peat-, coal- and gas-based energy system to an electricity-led system maximising our renewable energy potential, flexibility and being integrated into Europe's energy systems."*

The energy security package includes a range of measures to implement this approach by the prioritisation of the following:

1. *Reduced and Responsive Demand.*
2. *Renewables-Led System.*

3. *More Resilient Systems.*
4. *Robust Risk Governance.*

A key finding from the technical analysis conducted as part of the Energy Security Package is the interdependence of energy security on two essential pillars: '*harnessing our indigenous renewable energy resources at speed and at scale and the rapid electrification of energy demand'*. As such, the energy security package provides additional measures to supplement the existing measures introduced under previously published Government policy documents. Those additional measures most relevant to the Proposed Lifetime Extension are as set out in Action 10 of the report, "*To implement Planning and Consenting System Reforms and provide greater certainty to the sector."*

The Package therefore aims to ensure that the planning system is fully aligned and resourced to fully support accelerated renewable energy development. It also aims to ensure renewable energy projects are prioritised in line with the recast Renewable Energy Directive and RePowerEU.

The Proposed Lifetime Extension supports the Government's objectives in ensuring the State's energy security. This Proposed Lifetime Extension serves as a domestic renewable energy generator capable of providing clean electricity to the national electricity grid, contributing to a renewables-led system.

2.4.2.2 Proposed Lifetime Extension - Compliance with the National Renewable Energy Policy

At a European level, there is a clear upward trend in the revisions of renewable energy targets. With a current target of 42.5%, with an ambition to reach 45% by 2030, it is crucial that every existing renewable energy generator is retained where possible. The existing Taurbeg Wind Farm currently contributes to the 23% of energy currently sourced from renewable energy.

National Energy Policy aims to achieve two main gaols, 1) to decarbonise Ireland's national energy network, and 2) to increase Ireland's indigenous energy supply in order to improve the country's energy security. Taurbeg Wind Farm is an existing, low carbon and indigenous energy supply which provides clean, renewable energy to the national electricity grid. Therefore, the Proposed Lifetime Extension is in accordance with and supported by national energy policy.

2.5 Climate and Renewable Energy Target Progress

At a European level, in 2023 renewable energy sources accounted for 45.3% of gross electricity consumption in the EU, representing an increase from 2022 levels. Wind and hydro power accounted for more than two-thirds of the total electricity generated from renewable sources at 38.5% and 28.2% respectively. According to Eurostat, only a handful of countries were already meeting the 2030 target, with Ireland at 15.25% of overall share of energy being from renewable sources in 2023.

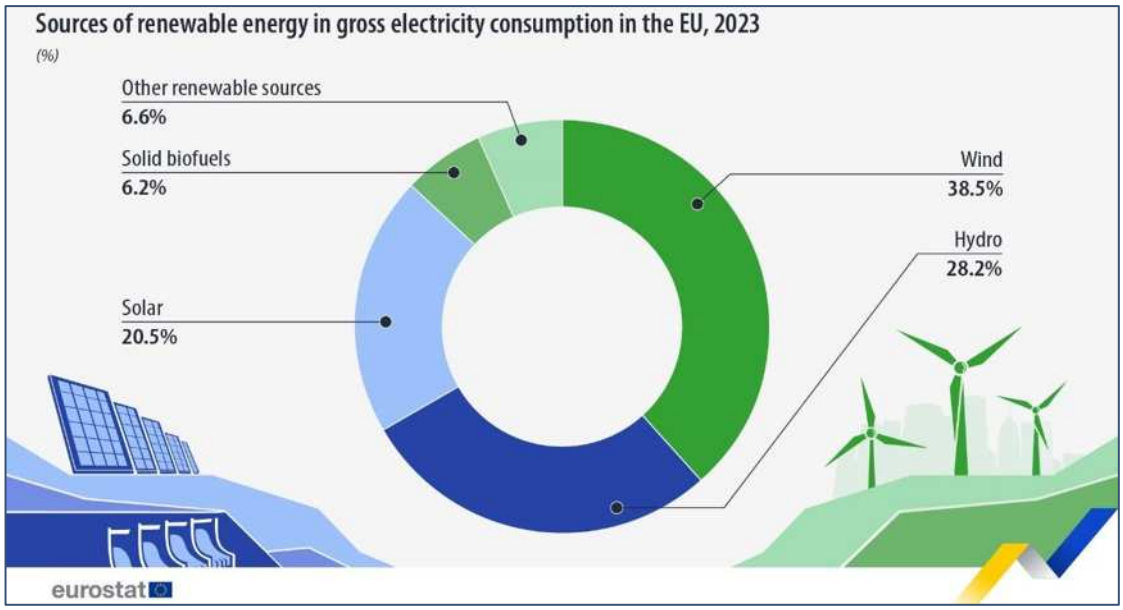

Figure 2-1: Overall share of energy from renewable sources (source: Eurostat)

Industry Research

Repowering Ireland (June, 2024) considered how Ireland can stay global leaders in onshore wind energy. Produced by MKO for Wind Energy Ireland (WEI) the report considered the real effect the loss of installed onshore wind energy capacity by 2030 will have on Ireland' carbon emissions, electricity prices, and ultimately meeting our climate goals. The research found that of the 4,347 MW of wind farms connected by Q3 2023, 854 MW will have to be decommissioned by 2030 and 2,488 MW by 2040, unless they are repowered or extended. The analysis of spatial planning policy across the local authority areas identified locations of existing operational wind farms and their underlying planning policy for wind energy development. The analysis shows that of the 4,347MW of operational wind farms, 26% (1,123MW) are located in areas in which wind energy developments are not favoured, 10% (446MW) are located in areas currently without any policy classification, which poses a challenge for their repowering potential. Only 65% are located in favoured areas, despite the fact that all existing wind farm locations previously being deemed appropriate for wind energy development when planning permission was first granted in previous decades. The research also considered the fact that some existing wind farms ripe for repowering are located in designated Special Protection Areas (SPAs) designated for the protection of hen harrier under the EU Birds Directive. This is particularly relevant given the research established that there is 732MW of wind energy generating capacity currently installed within the hen harrier SPAs, and a further 347MW installed within five kilometres of these same SPAs. The research also suggested a strategy for repowering wind farms in SPAs for hen harrier, which involves assessing the impacts on the conservation objectives of the SPAs, and exploring the possibility of proceeding through the Imperative Reasons of Overriding Public Interest (IROPI) route, drawing on the recent EU policies that classify renewable energy projects as being in the overriding public interest. Section 6 of the Report considers this in depth, considering repowering or extension of life of wind energy developments in SPAs specifically designated the protection of hen harrier. The conflict which exists between the necessary utilisation or expansion of existing wind energy developments in SPAs to meet national or European targets, and the need to protect and restore the populations of a critically endangered breeding bird species, is one where a solution must be found but the challenge cannot be underestimated. In that vein, it is of note that the Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA in which the subject site is located, contained 29 operational wind farms with a MW Capacity (MEC) of 617.46MW. A significant portion of onshore wind generation would be lost if upon the end of these wind farms lives, each are decommissioned and no replacement wind energy development erected or no extension to their operational life granted planning permission. The Report states:

"A number of further provisions on the RED III Directive EU 2023/2413 clearly indicate the intention of European legislation to consider renewable energy development as appropriate and necessary, even where the potential exists for impacts on protected birds and other species and habitats. These include the following (key text underlined):

> *Article 16b*
>
> *Permit-granting procedure outside renewables acceleration areas*
>
> *2. Where an environmental assessment is required pursuant to Directive 2011/92/ÆU or 92/43/EEC, it shall be carried out in a single procedure that combines all relevant assessments for a given renewable energy project. When any such environmental impact assessment is required, the competent authority, taking into account the information provided by the project developer, shall issue an opinion on the scope and level of detail of the information to be included by the project developer in the environmental impact assessment report, of which the scope shall not be extended subsequently. Where a renewable energy project has adopted necessary mitigation measures, any killing or disturbance of the species protected under Article 12(1) of Directive 92/43/EEC and Article 5 of Directive 2009/147/EC shall not be considered to be deliberate. Where novel mitigation measures to prevent as much as possible the killing or disturbance of species protected under Directives 92/43/EEC and 2009/147/EC, or any other environmental impact, have not been widely tested as regards their effectiveness, Member States may allow their use for one or several pilot projects for a limited time period, provided that the effectiveness of such mitigation measures is closely monitored and appropriate steps are taken immediately if they do not prove to be effective.*

On the basis of the above, it is considered likely that adequate justification could be made that the extension of life or repowering of wind farms within or adjacent to Irish SPAs, is of overriding public interest. There is no consideration of the scale of the development in the above text and therefore a credible case could be made that all renewable energy developments may be considered IROPI regardless of scale, until carbon neutrality is achieved."

The concluding findings of the Report should be noted:

> *"To take advantage of the above opportunity, it must be accepted that the repowering of wind farms within and adjacent to SPAs has the presumption of being of overriding public interest, unless otherwise proven on a case-by-case basis. It will also be necessary to agree the nature and scale of compensation/enhancement that will be required from each repowering development to offset any potential impact they may be having on hen harrier. There is also potential for the compensation/ enhancement associated with the repowering of wind farms to result in net gains for hen harrier ecology and conservation."*

Ireland's Greenhouse Gas Emissions Projections 2022 – 2040

The Environmental Protection Agency (EPA) publish Ireland's Greenhouse Gas Emission Projections and at the time of writing, the most recent report, 'Ireland's Greenhouse Gas Emissions Projections 2023–2050' was published in May 2024. The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2050 set out under the EU emission reduction targets as set out under the Effort Sharing Regulation.

The EPA has produced two scenarios in preparing GHG emissions projections to 2050, a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands GHG emissions in different ways. The WEM scenario assumes that no additional policies and measures, beyond those already in place by the end of 2022. This is the cut off point for which the latest national GHG emission inventory data is available, known as the 'base year' for projections. The WAM scenario has a higher level of ambition and includes Government policies and measures to reduce emissions such as those in Ireland's Climate Action Plan 2024.

The EPA Emission Projections Update notes the following key trends:

- Ireland is not on track to meet the 51 per cent emissions reduction target (by 2030 compared to 2018) based on these projections which include most 2024 Climate Action Plan measures. (emphasis added)
- Emissions from the Energy Industries sector are projected to decrease by between 57 and 62 per cent over the period 2022 to 2030. Renewable energy generation at the end of the decade is projected to range from 69 to 80 per cent of electricity generation as a result of a projected rapid expansion in wind energy and other renewables.
- Sectoral emissions ceilings for 2025 and 2030 are projected to be exceeded in almost all cases, including Agriculture, Electricity, Industry and Transport.
- The first two carbon budgets (2021-2030), which aim to support achievement of the 51 per cent emissions reduction goal, are projected to be exceeded by a significant margin of between 17 and 27 per cent.

As decarbonising electricity generation will have a significant positive contribution in achieving Ireland's emissions it is clear that additional renewable energy production such as that of the Proposed Lifetime Extension must be encouraged and supported if carbon saving targets are to be met.

National Energy Projections

The National Energy Projections report was published by the SEAI in December 2024 sets out the most recent updates to Ireland's progress towards its binding European and National renewable energy targets.

In 2023 REDII set an EU wide target for overall RES of 32% RES in 2030. Member states set their national contributions to the EU-wide target, with Ireland setting its at 34.1% in 2030. REDIII increased the binding EU-wide target for overall RES to at least 42.5% with Ireland subsequently increasing its target to 43% in 2030.

The decarbonisation of the electricity generation is critical considering the need to electrify other sectors such as heating and transport in order to achieve the sectoral decarbonisation targets. By 2030, renewable energy sources are anticipated to dominate electricity generation, particularly experiencing a significant surge later in the decade attributed to the integration of substantial offshore wind projects. In the CAP23 scenario, there is an expedited deployment of onshore renewable generation capacity in the earlier years of the decade compared to the CAP21 scenario. However, both scenarios aim to achieve a similar overall percentage of electricity derived from renewable sources (RES-E) by the year 2030.

Figure 1.27 of the Report, copied below, illustrates clearly the gap between the current installed wind capacity and the CAP targets.

Figure 1.27: Ireland's installed wind capacity with 2024 estimates, projections to 2030, CAP targets

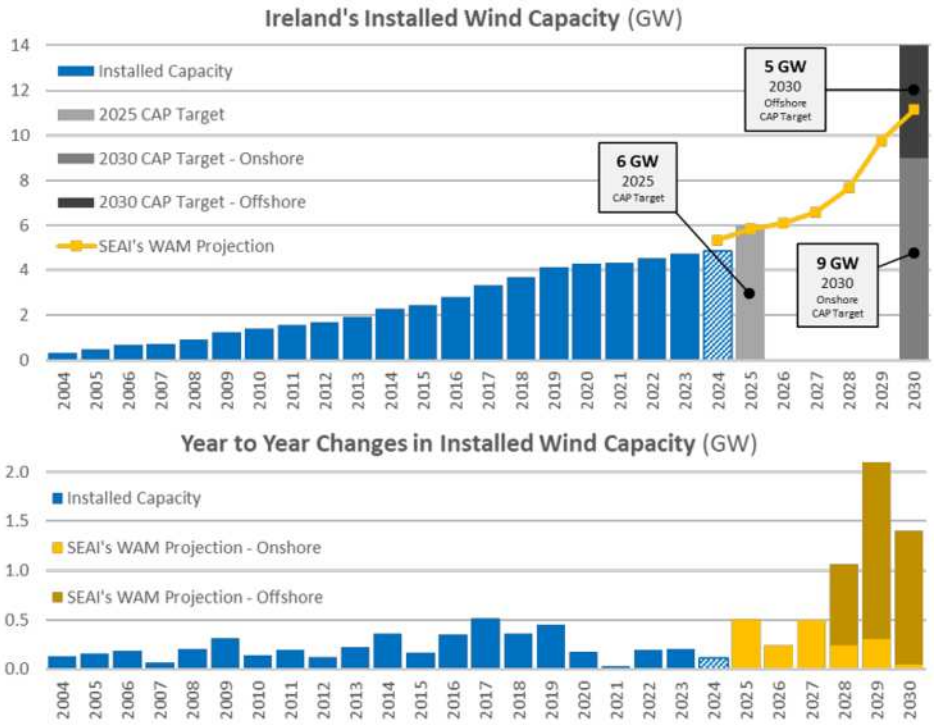

Figure 2-2: Ireland's installed wind capacity with 2024 estimates, projections to 2030, CAP targets

The SEAI projections explore the risk scenarios With Existing Measures (WEM) and With Additional Measures (WAM), the aim being to address the gap between current policy trajectories and the most ambitious planned policies scenarios. The SEAI scenario modelling do not consider the CAP24 but rather CAP23.The SEAI projections under the 'with additional measures' (WAM) scenario indicate a total installed capacity of 11.2GW by the end of 2030. The Report goes on to note that "*Over the last 10 years, Ireland has added wind capacity at an average rate of 0.26GW per annum, although this has dropped to a rate of 0.14GW over the last 5 years. To align with the pace of the WAM projections needed to deliver on the 80% RES-E target, the roll out of onshore wind capacity needs to return to the rate previously achieved between 2016 and 2019...*"

The report projects GHG emissions under the WEM and WAM scenarios. It notes that since April 2023 there has been a "*significant increase in net electricity imports across the interconnectors with the UK*" and "*electricity net-imports were far higher than other years, and higher than projected in the WEM or WAM scenarios...*" The report continues to consider two sectoral ceilings for the electricity sector – CB1 ceiling 2021-2025 (five year cumulative) ($MtCO_2eq$) and CB2 ceiling 2026-2030 (five year cumulative) ($MtCO_2eq$). It finds that in both the WEM and WAM scenarios, cumulative emissions reach the first sectoral ceiling in 2025, and the second in 2029.

It is clear from the projections outlined above that unprecedented action is required as soon as possible: *"Where any exceedance occurs, steeper reductions are required to compensate, leading to a larger reduction required by 2030."*

The Climate Change Advisory Council Annual Review 2024

The Climate Change Advisory Council (CCAC) open their 'Annual Review 2024-Summary for All' quite starkly, stating *"... progress to reduce emissions is not sufficient for Ireland to meet its national and EU climate obligations. Reliance on fossils fuels needs to end, and urgent action is required to ensure that people, places and nature can adapt to the changing climate and prepare for rapidly emerging climate risks. The current rate of policy implementation is too slow and fragmented, and more effective*

engagement across all segments of policy and society is required to empower sustainable decision-making and to understand and remove barriers to action." (emphasis added)

In addition, the standout recommendation from the CCAC is that *"So that Ireland can end its reliance on fossil fuels, Government should cease subsidising fossil fuel consultation and increase funding and make it more accessible to enable and accelerate the rapid uptake of low-carbon technologies and alternatives across all sectors."*

In relation to the electricity sector specifically planning reform continues to be cited as a key area requiring urgent attention.

Ireland's Climate Change Assessment

In January 2024, the EPA published Irelands Climate Change Assessment (ICCA). This assessment provides a comprehensive overview and breakdown of the state of knowledge around key aspects of climate change with a focus on Ireland. The ICCA report is presented in four volumes.

- Volume 1: Climate Science – Ireland in a Changing World
- Volume 2: Achieving Climate Neutrality in 2050
- Volume 3: Being Prepared for Irelands Future
- Volume 3: Realising the Benefits of Transition and Transformation

The ICCA Synthesis Report states that having peaked in 2001, Irelands GHG emissions have reduced in all sectors except agriculture. However, Ireland currently emits more GHG per person than the EU average. The report goes on to state that there has been an identified gap in policy that indicates that Ireland will not meet its statutory GHG emission targets. Achieving net zero carbon dioxide emissions by 2050 requires significant and unprecedented changes to Ireland's energy system. Policies tailored to suit different stages of technology development are critical for achieving a net zero energy system. Established technologies, such as wind energy, solar photovoltaics and bioenergy will be key in meeting short-term emission reduction targets (i.e. 2030), whereas offshore wind infrastructure is expected to be the backbone of future energy systems. This can only be achieved with appropriate support schemes, regulation and investments for synergistic growth of offshore wind and other renewable technologies.

There are well-established 'no-regret options' that need to happen now, which can get Ireland most of the way to net zero carbon dioxide emissions. Beyond that, there are 'future energy choices' relating to the scale and magnitude of technologies that will assist in achieving Ireland statutory climate targets. Ireland's no-regret options include deployment of market-ready renewables (e.g. wind energy and solar photovoltaics). Irelands future choices include hydrogen, carbon capture and storage, nuclear energy and electro-fuels. Renewable energy can increasingly provide our future energy needs but will need to be complemented with carbon dioxide removals to achieve a net zero energy system in hard-to-abate sectors.

The Climate Change Advisory Council Electricity Sectoral Review

The Climate Advisory Council published its annual review in May 2024, it outlines detailed observations and recommendations for the Electricity sector in Ireland. This review emphasises the urgent need for Ireland to accelerate its transition to renewable energy to meet its 2030 electricity capacity targes and adhere to sectoral emissions ceilings.

The Climate Change Advisory Council states:

> *"Ireland needs to reduce and ultimately prevent emissions of greenhouse gases. to stay within the agreed carbon budget, the Electricity sector needs to achieve the largest reduction in sectoral emissions of all sectors: a 75% decrease by 2030 compared with 2018."*

Key observations in relation to Renewable Electricity are outlined below:

- Renewables accounted for 41% of electricity demand in 2023, up from 39% in 2022.
- By the end of 2023, the total renewable grid capacity in Ireland was 5.7 GW, with the majority (4.7 GW) from onshore wind turbine installations.
- In 2023, only onshore wind (0.2 GW) generation was connected. This is significantly below the annual average increase of 1.6 GW of onshore renewables required to meet 2030 capacity targets.
- In 2023, 0.5 GW of wind projects received planning permission; however, no onshore wind projects were awarded permission before September. Appeals and judicial reviews, including for all of An Coimisiún Pleanála's approved projects, continue to delay the development of projects.

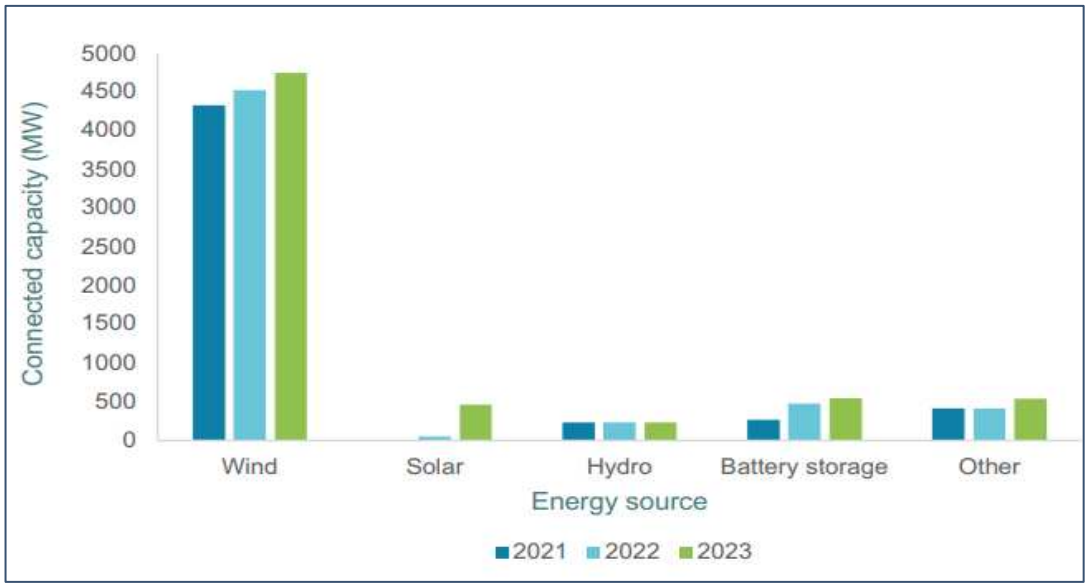

Figure 2-3: Renewable energy capacity and storage connected to the grid in Ireland 2021-2023

Energy in Ireland 2024 Report

In December 2024 the SEAI published their '*Energy in Ireland 2024 Report*', stating that in 2023, 44.3% of the electricity generated indigenously in Ireland came from gas, with renewables accounting for a further 40.7%. The overall renewable energy share for gross final energy consumption for 2023 was 14.1%. 2023 had the lowest energy-related emissions of any year in the last quarter century, except for 2020 which was heavily influence by the COVID-19 lockdowns. The SEAI Energy in Ireland 2024 report, states that energy- related emissions were down 8.3% from 2022 levels in 2023 and the carbon intensity of the national grid was down to 254 gCO2/kWh, which is the lowest carbon intensity value ever reached in Ireland.

The Proposed Lifetime Extension will continue to support the reduction of GHG emissions in Ireland through the generation of clean renewable wind energy from the Taurbeg Wind Farm.

2.6 Biodiversity and Nature Restoration Policy and Targets

2.6.1 European Biodiversity and Nature Restoration Policy

Nature Restoration Law 2024

The Regulation on Nature Restoration (Nature Restoration Law) came into effect on, August 18, 2024. The Nature Restoration Law is the first continent-wide, comprehensive law of its kind. It is a key element of the EU Biodiversity Strategy, which sets binding legal targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon, improve biodiversity values and to prevent and reduce the impact of natural disasters. The EU Nature Restoration Law seeks to repair European habitats that are in poor condition and enhance ecosystem services. The EU Nature Restoration Law seeks to restore 20% of the EU's land and sea areas by 2030 and all ecosystems by the year 2050.

The law aims to restore ecosystems, habitats and species across land and sea areas in the EU in order to:

- enable the long-term and sustained recovery of biodiversity and increase resilience
- contribute to achieving the EU's climate mitigation and climate adaptation objectives
- meet international commitments

Europe's nature is in alarming decline, with more than 80% of habitats in poor condition. Restoring peatlands, wetlands, rivers, forests, grasslands, marine ecosystems, and the species they host will help to:

- increase biodiversity,
- secure the things nature does for free, like cleaning our water and air, pollinating crops, and protecting us from floods,
- limit global warming to 1.5°C,
- and, build up Europe's resilience and strategic autonomy, preventing natural disasters and reducing risks to food security.

Full implementation of the law is crucial to restore the EU's biodiversity and stop further biodiversity loss, to reach climate neutrality by 2050 and adapt to climate change, and to enhance food security for EU citizens. In doing so, the law will support the achievement of other European ambitions, such as water security.

The regulation contains the following specific targets:

- ***targets based on existing legislation (for wetlands, forests, grasslands, river and lakes, heath & scrub, rocky habitats and dunes)*** *- improving and re-establishing biodiverse habitats on a large scale, and bringing back species populations by improving and enlarging their habitats*
- ***pollinating insects*** *– reversing the decline of pollinator populations by 2030, and achieving an increasing trend for pollinator populations, with a methodology for regular monitoring of pollinators*
- ***forest ecosystems*** *– achieving an increasing trend for standing and lying deadwood, uneven aged forests, forest connectivity, abundance of common forest birds and stock of organic carbon*
- ***urban ecosystems*** *– no net loss of green urban space and tree cover by 2030, and a steady increase in their total area from 2030*
- ***agricultural ecosystems*** *– increasing grassland butterflies and farmland birds, the stock of organic carbon in cropland mineral soils, and the share of agricultural land with high-diversity landscape features; restoring drained peatlands under agricultural use*
- ***marine ecosystems*** *– restoring marine habitats such as seagrass beds or sediment bottoms that deliver significant benefits, including for climate change mitigation, and restoring the habitats of iconic marine species such as dolphins and porpoises, sharks and seabirds.*

- ***river connectivity*** *– identifying and removing barriers that prevent the connectivity of surface waters, so that at least 25 000 km of rivers are restored to a free-flowing state by 2030*

Part 65 of the Nature Restoration Law relates specifically to restoration for habitats and species protected under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/EC (the Birds Directive), and states that:

> *"Restoration targets and obligations... for pollinators and for freshwater, urban, agricultural and forest ecosystems should be complementary and work in synergy, with a view to achieving the overarching objective of restoring ecosystems across the Member States' land and sea areas. The restoration measures required to meet one specific target will, in many cases, contribute to meeting other targets or fulfilling other obligations"*

Part 65 also states that:

> *"Restoration measures should also be planned in such manner that they address climate change mitigation and climate change adaptation and the prevention and control of the impact of natural disasters, as well as land degradation"*

Part 68 of the Nature Restoration Law specifically relates to the importance of addressing the dual climate and biodiversity crises and acknowledges that:

> *"the restoration of biodiversity should take into account the deployment of renewable energy and vice versa. It should be possible to combine restoration activities and the deployment of renewable energy projects, wherever possible"*

The Proposed Offsetting Measures will restore habitat for the benefit of hen harrier and will also improve biodiversity in the Proposed Offsetting Lands and is therefore in line with the Nature Restoration Law.

European Biodiversity Strategy for 2030

The EU Biodiversity Strategy for 2030 sets out an ambitious and far-reaching programme of measures to halt and reverse biodiversity loss in the EU.

The Strategy aims to address the five main drivers of biodiversity loss and put in place an enhanced governance framework, as well as address policy gaps, while at the same time consolidating existing efforts and ensuring the full implementation of existing EU environmental and climate legislation.

The Strategy highlights that the biodiversity and climate crisis are intrinsically linked. Just as the crises are linked, so are the solutions. Nature regulates the climate, and nature-based solutions, such as protecting and restoring wetlands, peatlands and coastal ecosystems, or sustainably managing marine areas, forests, grasslands and soils, will be essential for emission reduction and climate adaptation. The EU Biodiversity Strategy sets out four pillars:

- Protect Nature
- Restore Nature
- Enable Transformative Change
- EU Action to Support Biodiversity Globally

The Proposed Offsetting Measures which propose the restoration of open peatland, creation of scrub habitat and the restoration of the farmland habitat for the benefit of hen harrier, aligns with the EU Biodiversity Strategy as it will help to protect and restore nature.

EU Strategy on Adaptation to Climate Change (2021)

The European Commission adopted its new EU Strategy on Adaptation to Climate Change on 24 February 2021. The new strategy sets out how the European Union can adapt to the unavoidable impacts of climate change and become climate resilient by 2050. The Strategy has four principal objectives: to make adaptation smarter, swifter and more systemic, and to step up international action on adaptation to climate change.

The effects of climate change are already being felt, and so we must adapt more quickly and comprehensively. The strategy therefore focuses on developing and rolling out adaptation solutions to help reduce climate-related risk, increase climate protection and safeguard the availability of fresh water.

It will support the further development and implementation of adaptation strategies and plans at all levels of governance with three cross-cutting priorities:

- Integrating adaptation into macro-fiscal policy
- Nature-based solutions for adaptation
- Local adaptation action

Section 11 "*Promoting nature-based solutions for adaptation*" states:

> *"For example, protecting and restoring wetlands, peatlands, coastal and marine ecosystems; developing urban green spaces and installing green roofs and walls; promoting and sustainably managing forests and farmland will help adapt to climate change in a cost-effective way. It is vital to better quantify their benefits, and to better communicate them to decision-makers and practitioners at all levels to improve take-up"*

The Proposed Offsetting Measures are in accordance with the EU Strategy on Adaptation to Climate Change as it seeks to protect and restore habitats for the benefit of hen harrier.

2.6.1.2 Proposed Offsetting Measures - Compliance with European Biodiversity and Nature Restoration Policy

At the European level, the section above highlights several key legislative and strategic frameworks that support the Proposed Offsetting Measures. The Nature Restoration Law (2024) is a central piece of legislation that mandates the restoration of 20% of the EU's land and sea areas by 2030, with the goal of restoring all ecosystems by 2050. This law emphasises the restoration of habitats such as peatlands and grasslands, which are vital for biodiversity. The Proposed Offsetting Measures, which include the restoration of peatland and farmland habitats for the benefit of the hen harrier, are directly aligned with these objectives.

The European Biodiversity Strategy for 2030 further reinforces the importance of halting and reversing biodiversity loss. It promotes nature-based solutions, such as habitat restoration, as essential tools for both biodiversity conservation and climate adaptation. The Proposed Offsetting Measures supports this strategy by enhancing habitats that are critical for the hen harrier, a species protected under the EU Birds Directive.

Additionally, the European Climate Law (2021) set ambitious targets for achieving net-zero emissions by 2050 and a 55% reduction by 2030. The Proposed Offsetting Measures contribute to these goals by offsetting the potential significant effects of the continued operation of a renewable energy project. The EU Strategy on Adaptation to Climate Change (2021) also supports the project, as it emphasises the role of nature-based solutions in building climate resilience.

2.6.2 National Biodiversity and Nature Restoration Policy

National Biodiversity Action Plan

Ireland's 4th National Biodiversity Action Plan (NBAP) 2023-2030, strives for a "*Whole-of-Government, Whole-of-Society*" approach to the governance and conservation of biodiversity. It demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations and will implement this through a number of key targets, actions and objectives.

The Wildlife (Amendment) Act 2023 introduced a new public sector duty on biodiversity. The legislation provides that every public body, is obliged to have regard to the objectives and targets in the NBAP. The NBAP sets out five key objectives as follows:

- **Objective 1: Adopt a Whole-of Government,** Whole of-Society Approach to Biodiversity. Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.
- **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.
- **Objective 3: Secure Nature's Contribution to People.** Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.
- **Objective 4: Enhance the Evidence Base for Action on Biodiversity.** This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.
- **Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.** Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.

The Proposed Offsetting Measures are aligned with the NBAP as restoring peatland and other similar habitats, that are used by hen harriers, removes carbon dioxide from the atmosphere and supports climate resilience.

2.6.2.2 Proposed Offsetting Measures - Compliance with National Biodiversity and Nature Restoration Policy

At the national level, the NBAP adopts a whole-of-government approach to biodiversity conservation and emphasises the importance of habitat restoration and species protection. The Proposed Offsetting Measures support this plan by restoring habitats that support hen harrier and by contributing to broader biodiversity goals.

2.7 Planning Policy Context

This section of the EIAR provides the strategic planning context of the Proposed Project. As is examined below, the Proposed Project is in line with national, regional and local policies, frameworks, guidelines and plans. This section has been broken down to the following sections:

- National Policy Context
- Regional Policy Context
- Local policy Context

As a renewable energy project, the Proposed Project is consistent with the overall national policy objectives to increase penetration and deployment of renewable energy resources. Compliance with the Cork County Development Plan policies are dealt with in detail in the Local Policy section below. The Proposed Wind Farm is assessed in further detail against the provisions of the Cork County Development Plan in the Planning Report included within the planning application to Cork County Council.

2.7.1 National Policy Context

2.7.1.1 Proposed Lifetime Extension

National Policy Framework (2018)

The National Planning Framework (NPF), published in February of 2018, forms the top tier of the national planning policy structure which establishes the policy context for the Regional Spatial and Economic Strategies (RSES) and local level development plans. In an effort to move away from developer led development to one informed by the needs and requirements of society up to 2040, a number of objectives and policies have been put in place in order for the country to grow and develop in a sustainable manner.

- Developing a new region-focused strategy for managing growth;
- Linking this to a new 10-year investment plan, the Project Ireland 2040 National Development Plan 2018-2027;
- Using state lands for certain strategic purposes;
- Supporting this with strengthened, more environmentally focused planning at local level; and
- Backing the framework up in law with an Independent Office of the Planning Regulator.

The project population growth that Ireland is expected to experience - an increase of approximately 1 million people by 2040 - will place further demand on both the built and natural environment. To strengthen and facilitate more environmentally focused planning at the local level, the NPF states that future planning and development will need to:

> "*Tackle Ireland's higher than average carbon-intensity per capita and enable a national transition to a competitive low carbon, climate resilient and environmentally sustainable economy by 2050, through harnessing our country's prodigious renewable energy potential.*"

A key focus throughout the NPF is the fostering of a transition toward a low carbon, climate-resilient society. In this regard, one of the stated key elements of the NPF is an Ireland which has a secure and sustainable renewable energy supply and facilitates the ability to diversify and adapt to new energy technologies. Key features identified in the NPF to facilitate the transition towards a low carbon energy future include:

- A shift from predominantly fossil fuels to predominantly renewable energy sources.
- Increasing efficiency and upgrades to appliances, buildings and systems.
- Decisions around development and deployment of new technologies relating to areas such as wind, smart grids, electric vehicles, buildings, ocean energy and bio energy.

- Legal and regulatory frameworks to meet demands and challenges in transitioning to a low carbon society.

Relevant to the subject development, the **National Strategic Outcome 8** (*Transition to Sustainable Energy*), notes that in creating Ireland's future energy landscape, new energy systems and transmission grids will be necessary to enable a more distributed energy generation which connects established and emerging energy sources, i.e. renewables, to major sources of demand. The successful transition to a low-carbon power system will depend on the pillars of 1) *Sustainability*, 2) *Security of supply* and 3) *Competitiveness*. A common theme underpinning these pillars is the need for a fit-for-purpose transmission and distribution energy network. Specifically, the NPF states that reinforcement of the distribution and transmission network to facilitate planned growth and distribution of a more renewables focused source of energy across the major demand centres, e.g. the functional purpose of the extant grid connection.

Ireland's national energy policy under **Objective 55** aims to '*promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050'*. The NPF aims to ensure that decisions that are made today meet our future needs in a sustainable manner.

> *"The manner in which we plan is important for the sustainability of our environment. Our planning system has influence across a wide range of sectors, both directly and indirectly and interacts with many common issues related to effective environmental management, including water services, landscape, flood risk planning, protection of designated sites and species, coastal and marine management, climate mitigation and adaptation, and land use change."*

An overarching objective of the NPF is to foster a transition toward a low carbon, climate-resilient society, which reflects the policy ethos established at the European level of governance (e.g. climate change and renewable energy targets – Section 2.3 & 2.4). In this regard, one of the key themes of the NPF is the realisation of an Ireland which has a secure and sustainable renewable energy supply and the ability to diversify and adapt to new energy technologies. The NPF references the National Climate Policy Position (superseded by the then CAP 2019) which established the fundamental objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. The NPF emphasises that rural areas have a strong role to play in securing a sustainable renewable energy supply for the country and acknowledges that *"rural areas have significantly contributed to the energy needs of the country and continue to do so"*. In this regard, the NPF states:

> *"In meeting the challenge of transitioning to a low carbon economy, the location of future national renewable energy generation will, for the most part, need to be accommodated on large tracts of land that are located in a rural setting, while also continuing to protect the integrity of the environment".*

The NPF acknowledges that GHG emissions from the energy sector must be reduced by at least 80% by 2050 when compared to 1990 levels while ensuring a secure supply of energy exists. New energy systems and the maintenance / safeguarding of existing grid assets will be necessary for a more distributed, renewables focused energy system required to harness Ireland's considerable indigenous energy sources and *"connect the richest sources of that energy to the major sources of demand"*.

The Proposed Lifetime Extension represents a significant multi-million investment in a rural area, in the renewable energy industry which is essential for diversifying the energy sector, contributing to innovation in the rural economy and delivering on climate and energy targets. National Planning **Objective 21** of the NPF aims to *'Enhance the competitiveness of rural areas by supporting innovation in rural economic development and enterprise through the diversification of the rural economy into new sectors and services, including ICT-based industries and those addressing climate change and*

sustainability'. The existing Taurbeg Wind Farm is directly supporting economic growth in rural Co. Cork while also contributing to national, regional and local climate and renewable energy targets.

In regard to the above, it is clear that the provision of new renewable energy generation is in line with the aims and objectives of the NPF which seeks to transition to a low carbon economy.

National Planning Framework First Revision (2025)

On the 8th April 2025, the Government approved the National Planning Framework First Revision (Revised NPF) which was subsequently passed through both Houses of the Oireachtas. The Revised NPF aims to address changes that have occurred in Ireland since 2018.

The Revised NPF provides an updated projection for the population of Ireland, with the population expected to increase to 6.1 million by 2040. This population growth will place further demand on both the built and natural environment, and subsequently, the services required to meet said demands. In order to strengthen and facilitate more environmentally focused planning at the local level, the Revised NPF states that future planning and development will need to:

> *"Tackle Ireland's higher than average carbon-intensity per capita and enable a national transition to a competitive low carbon, climate resilient and environmentally sustainable economy by 2050, through harnessing our country's prodigious renewable energy potential."*

National Strategic Outcome 8 (*'Transition to a Carbon Neutral and Climate Resilient Society'*) notes that in creating Ireland's future energy landscape, new energy systems and transmission grids will be necessary to enable a more distributed energy generation which connects established and emerging energy sources, i.e. renewables, to major sources of demand.

Chapter 9: Climate Transition and Our Environment of the revised NPF aims to address key national environmental challenges including the transition to a climate neutral economy, sustainable land management, renewable energy and resource efficiency. As per **NPO 70**, the Revised NPF highlights the importance of renewable energy infrastructure to achieve national climate action targets.

> *"Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a climate neutral economy by 2050."*

Regional Renewable Energy Capacity Allocations have been introduced under the Revised NPF. This was one of the key actions for CAP24 and is supported under CAP25. The Southern Region, in which the Proposed Project is located, is allocated a target of installing an **additional 978 MW of onshore wind energy by 2030.** The Southern Region has a current (2023) energised capacity of 2,622 MW, to which the existing Taurbeg Wind Farm contributes to.

Under **NPO 74** Regional Assemblies are required to plan for the delivery of the regional renewable electricity capacity allocations outlined in the Revised NPF and identify allocations for each of the local authorities within their RSES. Furthermore, **NPO 75** requires Local Authorities to plan for the delivery of Target Power Capacity (MW) allocations consistent with the relevant RSES, through their City and County Development Plans. At the time of writing, no local Target Power Capacity allocations have been established, however it is clear from the regional allocation that the Southern Region is set to deliver a significant amount of onshore wind energy in the coming years.

The introduction of renewable energy targets represents a more active and prescriptive approach to land use planning for renewable energy development. The Revised NPF aligns the national target of 9GW of onshore wind energy with the policies and objectives of Local Authorities. In regard to this, it is clear that the continued operation of the existing Taurbeg Wind Farm is in line with aims and objectives of the Revised NPF, which seeks to transition to a carbon neutral economy.

National Development Plan 2021-2030

The National Development Plan 2021 – 2030 (NDP) was published on 4th October 2021 and sets out the major public investment projects identified by Government which are to play a significant role in addressing the opportunities and challenges faced by Ireland over the coming years such as Covid-19, Brexit, housing, health, population growth, and most relevant to the subject development, climate change. It is stated that the NDP 2021 – 2030 will be the *'largest and greenest ever delivered in Ireland'*, and in this regard, the NDP highlights that extensive consultation was undertaken to ensure that the plan adequately supports the implementation of climate action measures. Reflecting on the recent publication of the IPCC's 6th Assessment Report, the NDP notes that the Irish Government is fully committed to 'playing its part' to ensure that the worst climate change damage can be avoided, e.g. significant reductions in CO_2 and other GHG emissions as assisted by the achievement of both European and National renewable energy targets. Specifically, the NDP states that,

> *"The next 10 years are critical if we are to address the climate crisis and ensure a safe and bright future for the planet, and all of us on it.*
>
> *The investment priorities included in this chapter [Ch. 13] must be delivered to meet the targets set out in the current and future Climate Action Plans, and to achieve our climate objectives. The investment priorities represent a decisive shift towards the achievement of a decarbonised society, demonstrating the Government's unequivocal commitment to securing a carbon neutral future."*

Notwithstanding this, the NDP acknowledges that it is not its role to set out a specific blueprint for the achievement of Ireland's climate targets; but as noted above, facilitate capital investment allocations for the climate and environmental strategic priorities.

One of the NDP's strategic climate priorities in the need for low-carbon, resilient electricity systems; specifically, the plan commits to increasing the share of renewable electricity up to 80% by 2030. This is characterised by the NDP as an '*unprecedented commitment to the decarbonisation of electricity supplies*', which is certainly an ambitious and an explicit driver for the continued operation of renewable generators such as the Proposed Lifetime Extension. The focus of investment in renewable energy infrastructure is to contribute to a long-term, sustainable and competitive energy future for Ireland.

2.7.1.2 Proposed Offsetting Measures

National Planning Framework – First Revision (2025)

In April 2025, both houses of the Oireachtas approved the Government's Revised National Planning Framework (NPF). The revision reflects changes to Government policy that have taken place since the initial publication of the NPF six years ago, such as climate transition and nature restoration.

The following National Policy Objectives are applicable to the Proposed Offsetting Measures:

- ***NPO 85:*** *In line with the National Biodiversity Action Plan; the conservation, enhancement, mitigation and restoration of biodiversity is to be supported by:*
  - *Integrating policies and objectives for the protection and restoration of biodiversity, including the principles of the mitigation hierarchy of - avoid, minimise, restore and offset - of potential biodiversity impacts, in statutory land use plan.*
  - *Retention of existing habitats which are currently important for maintaining biodiversity (at local/regional/national/international levels), in the first instance, is preferable to replacement/restoration of habitats, in the interests*

of ensuring continuity of habitat provision and reduction of associated risks and costs.

- ***NPO 87:*** *Enhance the conservation status and improve the management of protected areas and protected species by:*
  - *Implementing relevant EU Directives to protect Ireland's environment and wildlife and support the objectives of the National Biodiversity Action Plan;*
  - *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites;*
  - *Continued research, survey programmes and monitoring of habitats and species.*
- ***NPO 89:*** *Protect, conserve and enhance the rich qualities of natural, cultural and built heritage of Ireland in a manner appropriate to their cultural and environmental significance.*

The Proposed Offsetting Measures propose to restore habitats to support hen harrier and will contribute to broader biodiversity goals, as such they are in line with the Revised NPF.

2.7.2 Regional Policy Context

2.7.2.1 Proposed Lifetime Extension

Regional Spatial and Economic Strategy for the Southern Region

The Southern Regional Assembly (EMRA) was established in 2015, is part of the regional tier of governance in Ireland and is primarily focused on the preparation and implementation of Regional Spatial and Economic Strategies (RSES), integration of Local Economic and Community Plans (LECPs), management of EU Operational Programmes, EU project participation, implementation of national economic policy, and working with the National Oversight and Audit Commission.

The RSES seeks to achieve balanced regional development and full implementation of Project Ireland 2040 – the National Planning Framework. It will be implemented in partnership with local authorities and state agencies to deliver on this vision and build a cohesive and sustainable region.

> *"The RSES primarily aims to support the delivery of the programme for change set out in Project Ireland 2040, the National Planning Framework (NPF) and the National Development Plan 2018-27 (NDP). As the regional tier of the national planning process, it will ensure coordination between the City and County Development Plans (CCDP) and Local Enterprise and Community Plans (LECP) of the ten local authorities in the Region."*

The RSES is committed to the implementation of the Climate Action Plan 2019 (superseded by CAP 24) by playing its part in the development of wind, wave, tidal, solar, hydro, and bio energy. The ambition is reflected in the Regional Policy Objectives (RPO's) which sets out the key regional policies for the 12-year lifetime of the plan. RPO 87: Low Carbon Future, states:

> *"The RSES is committed to the implementation of the Climate Action Plan 2019 by playing its part in the development of renewable energy. This is clearly reflected in the Regional Policy Objectives (RPO's) which sets out the key regional policies for the lifetime of the plan, from 2018 – 2030"*

With regards to climate change the RSES notes that:

> *"All global risks of climate change are risks to the Southern Region. The Southern Regional Assembly is committed to plays its role to put in place a high-level regional strategy for transition to a low carbon economy and society across all sectors."*

As noted and recognised by the RSES, Ireland and the EU are signatories to the Paris Agreement, a legally binding international agreement to restrict global temperature rises to below 2°C above pre-industrial levels, and to limit any increase to 1.5°C to significantly reduce the risks and impacts of climate change. It is further noted that *'Ireland's international commitments also extend to the UN's Sustainable Development Goal 13, to 'take action to combat climate change and its impacts."*

Chapter 5 of the RSES notes detail's the regions plans and objectives with regards to the environment. The RSES focus includes the following areas:

- Renewable Energy
- Energy Efficiency
- Sustainable transport
- Agriculture
- Forestry
- Climate resilience

The following Regional Policy Objectives have been listed with regards to climate change: ***RPO 87 Low Carbon Energy Future:*** *The RSES is committed to the implementation of the Government's policy under Ireland's Transition to a Low Carbon Energy Future 2015-30 and Climate Action Plan 2019. It is an objective to promote change across business, public and residential sectors to achieve reduced GHG emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture.*

RPO 88 National Mitigation Plan and National Adaptation Framework: *The RSES is committed to the implementation of the National Mitigation Plan and National Adaptation Framework: Planning for a Climate Resilient Ireland to enable the Region transition to a low carbon, climate resilient and environmentally sustainable economy. It is an objective to ensure effective co-ordination of climate action with the Climate Action Regional Offices and local authorities to implement the National Mitigation Plan and the National Adaptation Framework in the development and implementation of long-term solutions and extensive adaptation measures.*

RPO 90 Regional Decarbonisation*: It is an objective to develop a Regional Decarbonisation Plan to provide a framework for action on decarbonisation across all sectors. The Regional Decarbonisation Plan shall include existing and future targets for each sector and shall be prepared with key stakeholders, including the Climate Action Regional Offices, and shall identify the scope and role of the Plan, the requirements for SEA, AA and the timescale for its preparation. Implementation mechanisms and monitoring structures for the Plan should also be established.*

The region has ample resources of wind, solar and ocean energy to provide a significant amount of renewable energy. Over the next ten years there is a predicted growth in electricity demand to align with the Climate Action Plan. Extra generating capacity will be required to accommodate this demand. Wind energy is recognised as a major source of renewable energy generation capable of providing clean electricity to the grid and meeting the county's energy needs.

> *"The RSES recognises and supports the many opportunities for wind as a major source of renewable energy. Opportunities for both commercial and community wind energy projects should be harnessed, having regard to the requirements of DoHPLG Guidelines on Wind Energy. Wind Energy technology has an important role in delivering value and clean electricity for Ireland."*

The following Regional Policy Objectives have been listed with regard to renewable energy:

- ***RPO 95 Sustainable Renewable Energy Generation:*** *It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the*

Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation.

- ***RPO 97 Power Stations and Renewable Energy:*** *It is an objective to support the sustainable technology upgrading and conversion of power stations in the Region to increase capacity for use of energy efficient and renewable energy sources.*
- ***RPO 98 Regional Renewable Energy Strategy:*** *It is an objective to support the development of a Regional Renewable Energy Strategy with relevant stakeholders.*
- ***RPO 99 Renewable Wind Energy:*** *It is an objective to support the sustainable development of renewable wind energy (on shore and off shore) at appropriate locations and related grid infrastructure in the Region in compliance with national Wind Energy Guidelines.*
- ***RPO 100 Indigenous Renewable Energy Production and Grid Injection:*** *It is an objective to support the integration of indigenous renewable energy production and grid injection.*

Regional Policy Objectives 95 – 100 reflect the strong support for renewable energy throughout the RSES. The Proposed Lifetime Extension will continue to generate renewable electricity contributing to the objectives of the RSES. The Proposed Lifetime Extension is therefore in alignment with policy at a regional level.

The RSES also acknowledges the need to develop a strong grid to support the integration of renewable energy on to the national electricity grid. The RSES sets out a number of infrastructural RPOs, relevant to the Proposed Lifetime Extension which indicate that the Region's continued support and investment in renewable energy generation:

- ***RPO 220 Integrated Single Electricity Market (I-SEM):*** *It is an objective to support the Integrated Single Electricity Market (I-SEM) as a key priority for the Region and seek the sustainable development and reinforcement of the energy grid including grid connections, transboundary networks into and through the Region and between all adjacent Regions subject to appropriate environmental assessment and planning processes.*
- ***RPO 221 Renewable Energy Generation and Transmission Network:*** *a. Local Authority City and County Development Plans shall support the sustainable development of renewable energy generation and demand centres such as data centres which can be serviced with a renewable energy source (subject to appropriate environmental assessment and the planning process) to spatially suitable locations to ensure efficient use of the existing transmission network; b. The RSES supports strengthened and sustainable local/community renewable energy networks, micro renewable generation, climate smart countryside projects and connections from such initiatives to the grid. The potential for sustainable local/community energy projects and micro generation to both mitigate climate change and to reduce fuel poverty is also supported, The RSES supports the Southern Region as a Carbon Neutral Energy Region.*
- ***RPO 222 Electricity Infrastructure:*** *It is an objective to support the development of a safe, secure and reliable supply of electricity and to support and facilitate the development of enhanced electricity networks and facilitate new transmission infrastructure projects that might be brought forward in the lifetime of this plan under EirGrid's (2017) Grid Development Strategy (subject to appropriate environmental assessment and the planning process) to serve the existing and future needs of the Region and strengthen all-island energy infrastructure and interconnection capacity.*

2.7.2.2 Proposed Offsetting Measures

The Southern Regional Assembly ('SRA') was established in 2015, the Regional Spatial and Economic Strategy ('RSES') provides a high-level development framework for the Southern Region. The RSES

came into effect on 31st January 2020. It provides a 12-year strategy to deliver the transformational change that is necessary to achieve the objectives and vision of the Assembly.

The following policy objectives that relate to the Proposed Offsetting Measures within the RSES are as follows:

- ***RPO 117 Flood Risk Management and Biodiversity:*** *It is an objective to avail of opportunities to enhance biodiversity and amenity and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned. Plans and projects that have the potential to negatively impact on Natura 2000 sites are subject to the requirements of the Habitats Directive.*
- ***RPO 126 Biodiversity:***
  - *b. Support local authorities acting together with relevant stakeholders in implementing measures designed to identify, conserve and enhance the biodiversity of the Region; seek and support the implementation of the All-Ireland Pollinator Plan, National Biodiversity Action Plan and National Raised Bog SAC Management Plan;*
  - *e. Support local authorities to work with all stakeholders to conserve, manage and where possible enhance the Regions natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the Region.*

The RSES supports the Proposed Offsetting Measures as RPO 117 above supports enhancing biodiversity and protecting sensitive habitats, especially where flood risk managements will be in place. RPO126 also promotes the collaboration between local authorities and stakeholders in order to conserve and improve the biodiversity of an area.

2.7.3 Project Compliance with National and Regional Policy Context

2.7.3.1 Proposed Lifetime Extension

With regard to the above planning framework in place, the proposal to continue generating renewable energy from an existing operational wind farm is clearly supported at national and regional levels. The National Planning Framework calls for proactive responses to the growing population, and so growing energy demands. Given this projected population increase, it is considered that if the share of renewable energy onto the grid is not increased, Ireland will fail to reach the National and International targets on emission reductions. Should the Proposed Lifetime Extension be granted planning permission, the existing wind turbines will continue to contribute to Ireland's national targets and support the country in meeting its renewable energy and carbon emission reduction goals at the EU level, generating approx. 25MW to the national grid. The Proposed Lifetime Extension is directly supported by National Planning Objective 21, 54, and 55. At regional level, Regional Policy Objectives 95 – 100 reflect the strong support for renewable energy within the Region. The Proposed Lifetime Extension, if granted planning permission, will continue to generate renewable electricity thus contributing to the objectives of the RSES.

2.7.3.2 Proposed Offsetting Measures

At the national level, the Revised NPF outlines several policy objectives that are relevant to the Proposed Offsetting Measures. These include the conservation and restoration of biodiversity, the integration of biodiversity considerations into land use planning, and the enhancement of protected areas. The Proposed Offsetting Measures aligns with these objectives by restoring habitats and supporting the conservation of the hen harrier.

Regionally, the Southern Regional Assembly's RSES supports biodiversity enhancement and the protection of Natura 2000 sites. The Proposed Offsetting Measures aligns with regional objectives by enhancing biodiversity and promoting collaboration among stakeholders.

2.7.4 Local Policy Context

2.7.4.1 Proposed Lifetime Extension

Cork County Development Plan

The Cork County Development Plan 2022-2028 (CCDP) came into effect on 6th June 2022 and was also subject to a Ministerial Direction in accordance with section 31(4)(c) of the Planning and Development Act 2000, as amended however the requirements of this Direction did not relate to renewable energy and has no impact on the Proposed Lifetime Extension subject of this EIAR.

There is policy support at local level for the development of renewable energy projects in County Cork in accordance with the Cork County Development Plan 2022-2028. **Objective ET 13-1** aims to "*Ensure that County Cork fulfils its potential in contributing to the sustainable delivery of a diverse and secure energy supply and to harness the potential of the county to assist in meeting renewable energy targets and managing overall energy demand".*

Objective ET 13-2 of the CCDP states that the Council will aim to "*Support Ireland's renewable energy commitments as outlined in Government Energy and Climate Change policies by facilitating the development of renewable energy sources such as wind, solar, geothermal, hydro and bio-energy and energy storage at suitable locations within the county where such development has satisfactorily demonstrated that it will not have adverse impacts on the surrounding environment (including water quality), landscape, biodiversity or amenities" and "Support and facilitate renewable energy proposals that bring about a direct socio-economic benefit to the local community".*

Objective ET 13-4 of the Plan is considered particularly important in the consideration of the Proposed Lifetime Extension, as it offers clear support for the policy direction and sentiments being expressed at upper levels in the policy hierarchy (outlined above) and clearly states the Council are supportive of onshore wind:

> *"In order to facilitate increased levels of renewable energy production consistent with national targets on renewable energy and climate change mitigation as set out in the National Energy and Climate Plan 2021-2030, the Climate Action Plan 2021, and any updates to these targets, and in accordance with Ministerial Guidelines on Wind Energy Development, the Council will support further development of on-shore wind energy projects including the upgrading, repowering or expansion of existing infrastructure, at appropriate locations within the county in line with the Wind Energy Strategy and objectives detailed in this chapter and other objectives of this plan in relation to climate change, biodiversity, landscape, heritage, water management and environment etc"* (our emphasis added).

It is the case that within the County Development Plan the Site is within an area where wind energy is deemed '*Normally Discouraged*'. The nature of the proposal is such that no construction works are proposed and no new infrastructure proposed; the aim is to simply ensure the turbines which currently exist onsite and currently contribute to the amount of renewable energy generated in the County, can continue. The precise wording of the relevant Objective, **Objective ET 13-5: Wind Energy Projects** is:

"(a)*supports a plan led approach to wind energy development in County Cork through the identification of areas for wind energy development. The aim in identifying these areas is to ensure that there are minimal environmental constraints, which could be foreseen to arise in advance of the planning process.*

b) On-shore wind energy projects should focus on areas considered 'Acceptable in Principle' and 'Areas Open to Consideration' and generally avoid "Normally Discouraged" areas as well as sites and locations of ecological sensitivity". **Objective ET 13-8: Normally Discouraged** states that *"Commercial wind energy developments will be discouraged in these areas which are considered to be sensitive to adverse impacts associated with this form of development (either individually or in combination with other developments). Only in exceptional circumstances where it is clear that adverse impacts do not arise will proposals be considered."*

There is no objective or policy provision in the County Development Plan regarding sites such as the application site, where extending the operational life of the wind farm is wholly viable, and represents clear alignment with the wider planning policy framework.

Objective ET13-9: National Wind Energy Guidelines is also relevant to the proposal. It states:

> *"Development of on-shore wind should be designed and developed in line with the 'Planning Guidelines for Wind Farm Development 2006' and 'Draft Wind Energy Development Guidelines 2019" and any relevant update of these guidelines."*

Objective ET13-10: Development in line with Best Practice seeks to "*Ensure that wind energy developments in County Cork are undertaken in observance with best industry practices, and with full engagement of communities potentially impacted by the development. In accordance with the Code of Practice 'Good Practice for Wind Energy Development Guidelines 2016', wind energy development operators are required to put in place an effective complaints procedure in relation to all aspects of wind energy development projects, where members of the public can bring any concerns they have about operational difficulties, including noise and nuisance to the attention of the wind energy development operator."*

2.7.4.2 Proposed Offsetting Measures

Kerry County Development Plan 2022-2028

The Kerry County Development Plan 2022-2028 (KCDP) was adopted by the elected members of Kerry County Council (KCC) on the 4th of July 2022. Chapter 11 sets out the relevant policy in relation to the environment within the County. The KCDP highlights that over 40% of County Kerry is designated under the Natura 2000 network, representing the significance of the County's natural heritage and diverse and varied biodiversity. The policies included in the CCDP that are relevant to the Proposed Offsetting Measures include:

> ***KCDP 11-2****: Maintain the nature conservation value and integrity of Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). This shall include any other sites that may be designated at national level during the lifetime of the plan in co-operation with relevant state agencies.*
>
> ***KCDP 11-3:*** *Work with all stakeholders in order to conserve, manage and where possible enhance the County's natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the County.*
>
> ***KCDP 11-22:*** *Encourage and facilitate the retention and creation of features of local biodiversity value, ecological corridors and networks that connect areas of high conservation value such as watercourses, woodlands, hedgerows, earth banks and wetlands.*

The Proposed Offsetting Measures seeks to enhance and manage the Proposed Offsetting Lands for hen harrier in the townlands of Coom and Knockatee, County Kerry.

Kerry County Council's Biodiversity Action Plan 2022-2028

Kerry County Council's Biodiversity Action Plan 2022-2028 (KBAP) forms part of Volume 6 of the KCDP. The key objectives within the KBAP which relate to the Proposed Offsetting Measures are as follows:

- ***Objective 2:*** *To conserve, protect and enhance biodiversity and ecosystem services in the county*
- ***Objective 4:*** *Work with a range of stakeholders to ensure protection and enhancement of biodiversity in the*

The Proposed Offsetting Measures align with the KBAP as it seeks to restore habitat for the benefit of hen harrier and will improve biodiversity in the Proposed Offsetting Lands.

2.7.5 Project Compliance with Local Policy

2.7.5.1 Proposed Lifetime Extension

It is recognised that the Proposed Lifetime Extension is not located within an area which wind energy projects are deemed to be 'Acceptable in Principle' and 'Areas Open to Consideration'. It is the case, however, that the CCDP expresses its support for the development of wind energy and seeks to align with the national objective of delivering Ireland's legally binding targets with regard to an increased renewable energy share that will allow Ireland to obtain 80% of its electricity needs from renewable energy by 2030.

This legally binding obligation on Ireland to achieve ambitious renewable energy targets means that every project is of national importance in this regard. Given the urgent timelines within which our renewable energy targets must be achieved by delivering this form of energy onto the grid, it is important that existing wind energy projects are recognised as being of strategic importance and in the national interest in this regard.

Local authorities have an obligation under the Climate Action and Low Carbon Development Act 2015 as amended (the Climate Act) to exercise their development plan functions '*in a manner consistent with'* the National Climate Policies and Objectives as far as practicable.

Section 15 (1) of the Climate Act provides that:

> *"A relevant body shall, in so far as practicable, perform its functions in a manner consistent with— (a) the most recent approved climate action plan, (b) the most recent approved national long term climate action strategy, (c) the most recent approved national adaptation framework and approved sectoral adaptation plans, (d) the furtherance of the national climate objective, and (e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State." (the "National Climate Policies and Objectives")*

The Taurbeg Wind Farm has been in operation for over 18 years. It has the potential to continue generating, without any additional works at the site, for a further 10 years. This ability to contribute directly to other objectives of the Plan which, in light of national and European frameworks, is considered paramount.

The project has the ability to continue to deliver over 25MW to the national grid in the form of green, renewable energy and in this regard can be seen to be of national importance as Ireland seeks to achieve its legally binding renewable electricity targets. The project will have significant environmental benefits in terms of its direct contribution to crucial decarbonisation and climate change mitigation targets.

2.7.5.2 Proposed Offsetting Measures

Locally, the Kerry County Development Plan (2022–2028) emphasise the importance of biodiversity conservation, climate resilience, and sustainable development. The Proposed Offsetting Measures are consistent with these plans, particularly in their focus on enhancing habitats for the hen harrier and supporting climate adaptation.

2.8 Other Relevant Material Considerations

2.8.1 Proposed Lifetime Extension

DoEHLG Wind Energy Guidelines 2006

In June 2006, the then Department of Environment, Heritage and Local Government (DoEHLG) published 'Wind Energy Development Guidelines for Planning Authorities' (the 'DoEHLG 2006 Guidelines') under Section 28 of the Planning and Development Act, 2000, as amended. The aim of these guidelines was to assist the proper planning of wind power projects in appropriate locations around Ireland. The DoEHLG 2006 Guidelines highlight general considerations in the assessment of all planning applications for wind energy. They set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. They contain guidelines to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development.

Each wind project has its own characteristics and defining features, and it is therefore impossible to write specifications for universal use. Guidelines should be applied practically and do not replace existing national energy, environmental and planning policy.

Draft Revised Wind Energy Guidelines 2019

The Department of Housing, Planning and Local Government published the Draft Wind Energy Guidelines (referred to as the 'Draft 2019 Guidelines') in December 2019. The Draft 2019 Guidelines were open to public submissions up until the 19th of February 2020.

The Draft 2019 Guidelines clearly sets out the recognition that the proper planning and sustainable development of areas and regions must be taken into account when local authorities prepare their development plans and assess planning applications, irrespective of the significant role renewable energy has to play in tackling climate change.

The Draft 2019 Guidelines note that potential impacts of wind energy development proposals on the landscape, including the natural and built environment, must be considered along with the legitimate concerns of local communities. With this in mind, and in line with the previously stated "preferred draft approach", the Draft 2019 Guidelines primarily focus on addressing a number of key aspects including, but not limited to:

- Acceptable noise thresholds and monitoring frameworks;
- Visual amenity setback;
- Control of shadow flicker;
- Compliance with Community consultation and dividend requirements, as included within the obligatory Community Report; and
- Consideration of the siting, route and design of the Proposed Grid Connection Route as part of the whole project.

Under the consultation it was evident that a number of submissions made appeared to have observations surrounding similar points, these include but are not limited to themes such as noise, visual amenity set back and shadow flicker.

At time of writing the Draft 2019 Guidelines are not yet finalised and are not in force, with the relevant guidelines for the purposes of section 28 of the Planning and Development Act 2000, as amended remaining those published in 2006.

Engagement - Best Practice Guidelines

IWEA Best Practice Guidelines for the Irish Wind Energy Industry 2012

The Irish Wind Energy Association (IWEA) (now Wind Energy Ireland) published updated Wind Energy Best Practice Guidelines for the Irish Wind Industry in 2012. The guidelines aim to encourage and define best practice development in the wind energy industry, acting as a reference document and guide to the main issues relating to wind energy developments. The purpose of the Guidelines is to encourage responsible and sensitive wind energy development, which takes into consideration the concerns of local communities, planners, and other interested groups. The guidelines outline the main aspects of wind energy development with emphasis on responsible and sustainable design and environmental practices, on aspects of development which affect external stakeholders, and on good community engagement practices. In approaching the development of IWEA's guidelines the aim was to be complementary to the DoEHLG 2006 Guidelines.

IWEA Best Practice Principles in Community Engagement and Community Commitments 2013

IWEA extended its guidance with the publication of this Best Practice in Community Engagement and Commitment. IWEA and its members support the provision of financial contributions by wind farm operators to local communities and have sought to formulate best practice principles for the provision of a community commitment. The document sets out IWEA's best practice principles for delivering extended benefits to local communities for wind farm developments of 5 Megawatts (MW) or above. Best Practice Principles of community engagement when planning the engagement strategy and preparing associated literature are also outlined in the document. The aim of these guidelines is to ensure that the views of local communities are taken into account at all stages of a development and that local communities can share in the benefits.

Further details on the community engagement that has been undertaken as part of the Proposed Project are presented below.

DCCAE Code of Practice for Wind Energy Development Ireland – Guidelines for Community Engagement 2016

In December 2016, the Department of Communications, Climate Action and Environment (DCCAE) issued a Code of Practice for wind energy development in relation to community engagement. The Code of Good Practice is intended to ensure that wind energy development in Ireland is undertaken in adherence with the best industry practices, and with the full engagement of local communities.

Community engagement is required through the different stages of a project, from the initial scoping, feasibility and concept stages, right through construction to the operational phase. The methods of engagement should reflect the nature of the project and the potential level of impact that it could have on a community. The guidelines advise that ignoring or poorly managing community concerns can have long-term negative impacts on a community's economic, environmental or social situation. Not involving communities in the project development process has the potential to impose costly time and financial delays for projects or prevent the realisation of projects in their entirety.

2.8.2 Proposed Offsetting Measures

Biodiversity Climate Change Sectoral Adaptation Plan

The Biodiversity Climate Change Sectoral Adaptation Plan considers terrestrial, freshwater and marine biodiversity and ecosystem services. The goal is to protect biodiversity from the impacts of climate change and to conserve and manage ecosystems so that they deliver services that increase the adaptive capacity of people and biodiversity. This is aimed to be achieved through following the six key objectives set out in the plan:

- **Objective 1: Protect, restore and enhance biodiversity to increase the resilience of natural and human systems to climate change** is supported by actions including implementation of the All Island Pollinator Plan, building on the EPA soil protection strategy, rejuvenation of Invasive Species Ireland, consideration of coastal zone management that will be embedded in relevant policies including the National Marine Planning Framework (Ireland's National Marine Spatial Plan), the incentivisation of farmers and land owners to protect biodiversity and the use of existing data to inform future management.
- **Objective 2: Improve understanding of the impacts of climate change on biodiversity.** The action that underpins all others for this objective is the execution of a comprehensive vulnerability assessment of biodiversity in Ireland, including a priority impact assessment to determine the factors that contribute to exposure and sensitivity and to identify the most at-risk species and habitats for priority attention.
- **Objective 3: Improve landscape connectivity to facilitate mobility in a changing climate.** The actions under this Objective will determine what species and habitats are vulnerable to fragmentation and look at ways of enhancing connectivity across the landscape and reducing barriers to movement. The connectivity of coastal and marine protected areas will also be considered.
- **Objective 4: Engage society and all sectors to protect biodiversity to enhance resilience.** Engaging the public, schools, businesses and local community organisations will be key to creating a better understanding of the impacts of climate change on biodiversity and to building support for investment in biodiversity as a key asset in resilience building. Designing and managing green and blue spaces that allow people to enjoy nature, while sequestering carbon and increasing resilience is a win-win for biodiversity, human health, eco-tourism and climate action.
- **Objective 5: Ensure sufficient financing is available to implement the Biodiversity Climate Change Adaptation Plan.** A financial strategy will be developed to address the finance gap combining suitable and nationally adapted mechanisms and to achieve cross departmental buy-in. A Policy and Institutional Review will analyse positive and negative policies and subsidies to fully outline the challenge of not only mobilising finance, but of ensuring policy and environmental fiscal reform
- **Objective 6: Put adequate monitoring and evaluation measures in place to review the implementation of the Biodiversity Climate Change Adaptation Plan.** The first and underpinning action for this objective is to collate and cross-reference actions in other sectoral plans to realise synergies, avoid maladaptation actions and monitor their contribution to this Plan

The Proposed Offsetting Measures are in accordance with this policy as new habitats will be created for hen harrier, whilst strengthening the surrounding ecosystem and protecting vulnerable species. The Proposed Offsetting Measures will also deepen the understanding of how climate change impacts certain bird species.

Hen Harrier Threat Response Plan 2024-2028

The Hen Harrier Threat Response Plan 2024-2028 was published by the National Parks and Wildlife Service (NPWS) in September 2024. As per the published document, *the aim of the Hen Harrier Threat Response Plan is to improve the long-term prospects for the species and to meet the objectives of the Birds Directive by:*

- *synthesising the key scientific evidence for the hen harrier population decline,*
- *outlining the views and concerns presented by the relevant sectors,*
- *laying out a coordinated set of targeted actions and measures to cease, avoid, reverse, reduce, eliminate or prevent the identified threats, pressures and hazards.*

The Threat Response Plan details 47 actions across five areas: Cross-cutting Sectoral Actions, Agriculture, Forestry, Wind Energy and Review & Update. The broad topics included under Wind Energy are copied below:

- Informing assessment procedures with fit for purpose data construction monitoring actions.
- Improving access to data.
- Promoting effective cumulative level assessments, including collision risk modelling, at various scales.
- Efficacy of adaptive management measures, including for offsetting purposes.
- Robustness of Environmental Assessments.
- Wind Energy Development Guidelines.
- Early identification of potential problems.
- Collation of relevant planning documents.
- Promoting high quality assessments.

The Proposed Offsetting Measures are aligned with the above policy as it supports the targets to improve the long-term survival of hen harrier. Habitat restoration also directly supports the plans as it will contribute to biodiversity conservation.

NPWS Conservation Objectives Supporting Document: Breeding Hen Harrier

The National Parks and Wildlife Service published a detailed Conservation Objectives Supporting Document for breeding hen harrier in September 2022. The Targets detailed in the document for the SPA network are copied below, as are the specific targets for the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA where relevant:

- The SPA network Target for the attribute 'population size' is to restore the numbers of confirmed breeding pairs to at least 77 – 78 confirmed breeding pairs.
  - Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA = Restore the numbers of confirmed breeding pairs to at least 38–39 confirmed breeding pairs.
- The SPA network Target for the 'productivity rate' is at least 1.0–1.4 fledged young per confirmed pair.
  - Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA = Maintain at least 1.0 – 1.4 fledged young per confirmed pair.
- The Target for 'spatial utilisation of breeding pairs' is at least 86% of the total SPA network area.
  - Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA = Restore the spatial utilisation of the SPA by breeding pairs to at least 97–98%
- For the SPA network, the Target for the attribute 'extent and condition of heath and bog' is to restore the extent and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation.

- For the SPA network, the Target for the attribute 'extent and condition of low-intensity managed grassland habitat' is to restore the extent and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation.
- The Target for the SPA network is to maintain, at least, the length and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation.
- The SPA network Target for the attribute 'age structure of the forest estate' is to achieve an even and consistent distribution of age-classes across the forest estate.
- The Target for the SPA network is that disturbance occurs at levels that do not significantly impact upon breeding hen harrier.

The Proposed Offsetting Measures are supported by this policy as it should help to increase the number of hen harrier breeding pairs, in line to meet the targets listed above. Habitat restoration is essential to achieving the targets in this policy document.

2.9 Planning History

This Section of the EIAR sets out the relevant planning history of the Proposed Lifetime Extension (CCC) site and the Proposed Offsetting Lands (KCC) and also identifies wind energy developments within the wider area (20km from the existing Taurbeg Wind Farm turbines).

2.9.1 Planning Applications within the Proposed Lifetime Extension application site boundary

A planning search was carried out through CCC's online planning portal in July 2025 for relevant valid planning applications within the red line planning application site boundary. 4 no. planning permissions were identified within the red line planning application boundary. All planning applications relate to the existing Taurbeg Wind Farm. The planning applications within the red line boundary are outlined in the table below.

Table 2-3: Planning Applications within the Site Boundary (Turbines)

Pl. Ref:	Description	Decision
16/6366	To amend Condition No. 7 of windfarm development permitted under planning Reg No. 02/3608 which specified that 'the structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development to allow for a period of 25 years from the date of commissioning instead of 20 years specified in the condition and extend the permitted operational lifetime of the Taurbeg Windfarm for a period of 5 years (2026-2031) and Permission for the clear felling of approximately 0.15ha of existing conifer plantation and the replanting of same	Refused by CCC, 18.11.2016
05/602	Borrow pit to win road stone for on site access tracks associated with construction of wind farm permitted under Reg. No.02/3608, and a short section of access track	Granted by CCC, 09.05.2005
01/6549	Erection of 10.88km of 38KV overhead line	Granted by CCC, 06.03.2002

02/3608	Windfarm to include 14 turbines, anemometer mast, control room/substation, temporary site compound/control room, access tracks and ancillary works	Granted by CCC, 07.04.2003

2.9.2 Planning Applications within the Proposed Offsetting Lands application site boundary

A planning search was carried out through KCC's online planning portal in July 2025 for valid planning applications within or overlapping with the boundary of the Proposed Offsetting Lands red line planning application site boundary. Only 1 no. application was found to overlap marginally with the site boundary, as detailed below in Table 2-4. This application dates from 1998 and relates to a wind farm, however development was not carried out under this permission. The planning permission has since expired.

Table 2-4: Planning Applications within the Site Boundary (Proposed Offsetting Lands)

Pl. Ref:	Description	Decision
9811	Erect a wind farm incorporating 23 turbines, a control house, anemometer station and service rods for same	Granted KCC, 23.11.1998; Granted by ACP (PL08.109598) 16.09.1999

2.9.3 Wind Energy Developments within 20km of the existing Taurbeg Wind Farm Turbines

A planning search was carried out to establish permitted and operational wind farms within 20km of the existing Taurbeg Wind Farm turbines. The search was carried out using the relevant local authority planning portals and An Coimisiún Pleanála's portal in July 2025 for relevant planning applications.

Table 2-5: Wind Energy Developments within 20km of the existing Taurbeg Wind Farm turbines

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
Ballagh Wind Farm	Pl. Ref. 06/128	Construction of a wind farm consisting of three wind turbines, electric substation with control building, meteorological pole, construction, extension and upgrading of existing internal site tracks and associated work. An EIS has been submitted as part of this application	Limerick	Granted	Operational	2
	ACP PL13.223648	Third Party Appeal Construction of a wind farm consisting of three wind turbines, electric substation with control building, meteorological pole, construction, extension and upgrading of existing internal site tracks and associated work. An EIS has been submitted as part of this application	Limerick	Granted by ACP	N/A	-
	EOD Ref: 12/7135	06/128-construction of a wind farm consisting of three wind turbines, electric substation with control building, meteorological pole, construction, extension and upgrading of existing internal site tracks and associated work. An EIS has been submitted as part of this application	Limerick	Granted	N/A	-
Coolleagrean Wind Farm	Pl. Ref: 06/1489	Erect a wind farm consisting of 7 no. Wind turbines with a hub height of up to 70m approximately and a propeller radius of up to 40m approximately, 50m height wind monitoring mast, access roads, and ESB substation and ancillary site works. An EIS has been submitted as part of the application	Kerry	Granted	Operational	7
	EOD Ref: 06/91489	Extension of Duration - Erect a wind farm consisting of 7 no. Wind turbines with a hub height of up to 70m approx. And a propeller radius of up to 40m approx., 50 m height wind monitoring mast, access roads and ESB substation and ancillary site works	Kerry	Granted by KCC – for an additional 5 years. Permission will expire	N/A	-

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
				on the 31.01.2017		
	Pl. Ref: 17/1193	Continue use of existing wind farm granted under planning ref 06/1489 and 06/91489 for a further period of five years to extend the operational life of the existing wind farm from 20 to 25 years. An environmental impact assessment report (EIAR) and a natura impact statement will be submitted to the planning authority with this application	Kerry	Granted 02.05.2018, expiry 01.05.2023	N/A	-
Cordal Wind Farm	Pl. Ref: 10/692	Construct a windfarm comprising 28 no. wind turbine generators with a maximum hub height of 90m, a maximum rotor diameter of 90m, a maximum rotor diameter of 90m and a maximum hub overall height of 135m, an electrical substation compound, control building, anemometer (2 no.) and associated site infrastructure including site roads, crane hardstandings and underground cabling. an environmental impact statement will be submitted with this application	Kerry	Refused	N/A	N/A
	ACP PL08.239473	First Party Appeal against the decision by KCC to refuse permission	Kerry	Granted by ACP	Operational	28
Dromcoliher Wind Turbine	Pl. Ref: 12/281	Retention permission for existing wind turbine (27.13m in height) and Permission for the construction of a lean-to machinery store extension to existing agricultural machinery store/workshop, upgrading of existing agricultural entrance and all associated site works	Limerick	Granted	Operational	1
Dromdeeveen Wind Farm	Pl. Ref: 02/1871	Construction of wind farm comprising wind turbines and switchyard	Limerick	Granted	Operational	7
	Pl. Ref: 04/2722	Erection of windfarm comprising of increased dimensions for 7 previously permitted wind turbines, 11 additional turbines, anemometer mast and access tracks. An EIS has been submitted as part of this application.	Limerick	Granted	Operational	7
Glentane Wind Farm/Glentanemacelligot Wind Farm 1	Pl. Ref: 02/4283	Windfarm to include 6 no. wind turbines, 2 no. 50m meteorological masts, substation/control building site tracks & assoc. works	Cork	Granted	Operational	6
	Pl. Ref: 06/4077	Modification to permitted development 02/4283 to include 6 no. turbines, hub height of 80m and blade diameter of 90m and blade tip height of	Cork	Granted	N/A	-

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
		125m, 2 no. 80m high wind monitoring masts, ESB substation compound with control building, site tracks and associated site development works				
	Pl. Ref: 10/8024	Completion of 6 no. turbines of hub height 80m and blade diameter of 90m and blade tip height of 125m, 2 no. 80m high wind monitoring masts, ESB substation compound with control building, site tracks and associated site development works as granted under Planning Reg. no. 06/4077	Cork	Granted	N/A	-
Glentane Wind Farm/Glentanemacelligot Wind Farm 2	Pl. Ref: 08/10248,	Erection of 8 no. wind turbines with hub height of 80m, blade diameter of 90m and overall height from ground to blade tip of 125m, construction of 4 no. borrowpits and internal site tracks and associated works	Cork	Granted	Operational	5
	ACP PL.04.235930	Third Party Appeal - Erection of 8 no. wind turbines with hub height of 80m, blade diameter of 90m and overall height from ground to blade tip of 125m, construction of 4 no. borrowpits and internal site tracks and associated works	Cork	Granted with revised conditions removing turbines 11, 12 and 13 (i.e. 5 in total granted)	N/A	-
Gortnacloghy Wind Farm	Pl. Ref: 04/3021,	construction of wind farm consisting of 2 no. wind turbines (hub height 80m), an electrical substation with control building, internal site track walls and associated site works	Limerick	Granted	Operational	2
	Pl. Ref: 11/7115	Additional period of 5 years for the completion of the construction of a wind farm consisting of 2 no. wind turbines, an electrical substation with control building, internal site trackways and associated works	Limerick	Granted with an expiry of 26.01.2017	N/A	-
Kilberehert Wind Farm	Pl. Ref: 10/5791	Wind farm consisting of 3 no. wind turbines with 80 metre hub heights and 90 metre rotors (125 metre tip heights), a sub-station, upgrading of existing farm tracks and construction of new access tracks and all ancillary works	Cork	Granted	Operational	3

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
Knockacummer Wind Farm	Pl. Ref: 04/8354,	29 no. wind turbines (hub height 80 m, blade diameter 90 m), electrical sub station with control building, 2 no. 80 m high meteorological masts, construction and extension of internal site tracks and associated works.	Cork	Granted	Operational	29
	ACP PL.04.210685	Third Party Appeal against the decision to grant permission for 29 no. wind turbines (hub height 80 m, blade diameter 90 m), electrical sub station with control building, 2 no. 80 m high meteorological masts, construction and extension of internal site tracks and associated works.	Cork	Granted by ACP	N/A	-
	Pl. Ref: 10/5211	Completion of construction of 29 no. wind turbines, 2 no. meteorological masts, electrical substation, construction and upgrading of internal site tracks and associated works granted under pl.reg.no. 04/8354 (New permission to expire on 22/12/2014)	Cork	Granted	N/A	-
Knockawarriga Wind Farm 1	Pl. Ref: 02/1937	Construction of a windfarm consisting of 9 wind turbines (hub height 67m, blade diameter 80m), an electrical substation with control building, one 50m high meteorological mast and construction and extension of existing internal site tracks and associated works	Limerick	Granted	Operational	9
	Pl. Ref: 04/1289	an increase of the turbine hub height from 67m to 80m and an increase of the blade tip height from 107m to 120m in the existing planning permission for a wind farm ref. 02/1937	Limerick	Granted	N/A	-
Knockawarriga Wind Farm 2	Pl. Ref: 12/459	a windfarm which comprises of 5 no. turbines (hub height 80m, blade rotor diameter not exceeding 93m, blade tip not exceeding 126.5m), construction of 2.94km approx. of additional new access roads, a borrow pit, 3 no. attenuation ponds and associated site development works. The proposed windfarm forms the second phase of, and is located adjacent to, an existing operational windfarm known as Knockawarriga (permitted under 02/1937 & 04/1289). Vehicular access to the development will be via 2 no. access points from the public road L-7044 as follows; a new access from the L-7044 to serve 4 no. of the proposed turbines, and a repositioned access from the L-7044 to serve the existing windfarm permitted under 02/1937 and 1 no. of the proposed new turbines. The period during which the permission will have effect (the appropriate	Limerick	Refused	N/A	N/A

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
		period) is sought for 10 years. An Environmental Impact Statement and a Natura Impact Statement are submitted as part of this application				
	ACP PL13.242166	First Party Appeal against the decision by LCC to refuse permission	Limerick	Granted by ACP with revised conditions limiting development to 3 turbines only	Operational	3
Mauricetown /Ashford Wind Farm	Pl. Ref: 12/379	10 year permission for retention and completion for the construction, operation and decommissioning of up to 6 no. wind turbines and ancillary works.	Limerick	Refused	N/A	-
	ACP PL13.240910	First Party Appeal against the decision to refuse planning permission	Limerick	Granted	Operational	6
Mount Eagle Wind Farm	Pl. Ref: 01/3884,	Construct a windfarm consisting of 8 no. 850kw wind turbines with hub heights of 44m and a rotor diameter of52m and associated works, with EIS	Kerry	Granted	Operational	8
	Pl. Ref: 01/93884	Extension to the existing wind farm, comprising 2 no turbines (no substation)	Kerry	Granted	Granted, not built	-
Rathcahill Wind Farm	Pl. Ref: 07/281	Erection of 6 no. wind turbines, electrical substation and control building, construction and upgrading of site trackways and associated site works. Previous planning ref. 01/2486 & 02/777	Limerick	Granted	Operational	5
Scartaglen Wind Farm 1	Pl. Ref: 13/114	Construct a wind farm including twelve (12) no. Wind turbines (with a maximum height of up to 126.5m), one (1) no. Permanent meteorological mast, (1) no. Substation, the provision of new and upgraded internal site service roads, underground cabling and all associated infrastructure. The proposed development would entail the construction of 12 no. Wind turbines which would be higher than the 12 no. Turbines previously	Kerry	Granted	Operational	11

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
		granted planning permission on the site under planning register nos. 08/1675,08/2030, and 09/1284. A ten year planning permission is being sought to construct the development. An environmental impact statement and natura impact statement have been prepared in respect of this application				
Scartaglen Wind Farm 2	Pl. Ref: 13/725	Construct an extension to a permitted twelve turbine wind farm development (planning ref 13/114). The development will consist of six wind turbines (hub height up to 85m and maximum blade tip height of up to 126.5 m), upgrading of existing access roads, construction of additional access roads, further development of two existing borrow pits on the site and associated ancillary works. Development previously granted under Kerry county council planning ref 13/114 will facilitate the proposed extension to the wind farm. Planning permission is being sought for a ten year period. An environmental impact statement (EIS) and natura impact statement (nis) accompany the application	Kerry	Granted	Operational	4
Tournafulla Wind Farm	Pl. Ref: 01/406,	Construction of a wind farm consisting of 17 turbines (65m Hub Height) electrical substation with control building, 50m high meteorological mast, construction and upgrading of site entrances, site trackways and associated works	Limerick	Granted	Operational	17
	Pl. Ref: 02/147	Construction of one wind turbine (65 metres hub height), an electrical metering station and site trackway	Limerick	Granted	Operational	1
	Pl. Ref: 04/3386	Modifications to planning ref. 01/406 consisting of a change in type and location of the lattice meteorologist mast and location of turbine no. 17, construction of site trackways and associated site works	Limerick	Granted	N/A	-
	Pl. Ref: 06/2455	Extension of planning permission ref: 01/406 (granted 13.09.2001)	Limerick	Granted, permission to expire on the 12th of September 2010	N/A	-

Name	Planning Ref	Description	County	Decision	Status	No. Of Turbines
WED Cross	Pl. Ref: 06/12438	Construction of 2 no. wind turbines up to 85m hub height and up to 80m blade diameter, 2 no. transformers, site tracks and associated works	Cork	Granted	Operational	2

It is noted that a single domestic turbine exists at Newmarket, County Cork which is visible on aerial imagery. Given its nature and scale (domestic) is it not considered likely to have a cumulative landscape and visual impact.

2.10 Scoping and Consultation

Scoping is the process of determining the content, depth and extent of topics to be covered in the environmental information to be submitted to a competent authority for projects that are subject to Environmental Impact Assessment (EIA). This process is conducted by contacting the relevant authorities and Non-Governmental Organisations (NGOs) with interest in the specific aspects of the environment with the potential to be affected by the proposal. These organisations are invited to submit comments on the scope of the EIAR and the specific standards of information they require. Comprehensive and timely scoping helps ensure that the EIAR refers to all relevant aspects of the Proposed Project and its potential effects on the environment and provides initial feedback in the early stages of the design iteration process where applicable. In this way scoping not only informs the content and scope of the EIAR, it also provides a feedback mechanism for the proposal design itself where applicable.

A scoping letter, providing details of the Proposed Project, was prepared by MKO and circulated in February 2024. MKO requested the comments of the relevant personnel/bodies in their respective capacities as consultees with regards to the EIAR process. As part of the constraints mapping process, which is detailed in Chapter 3 of this EIAR, telecommunications operators were contacted in November 2023, January 2024 and February 2024 in order to determine the presence of telecommunications links either traversing or in close proximity to the Site.

2.10.1 Scoping Responses

Table 2-6 lists the responses received from the bodies to the scoping letter circulated. Copies of all scoping responses are included in **Appendix 2-1** of this EIAR. If further responses are received, the comments of the consultees will be considered in the Proposed Project in the event of a grant of planning permission. The recommendation of the consultees has informed the scope of assessments undertaken and the contents of the EIAR.

Table 2-6: Scoping Replies

Consultee Name	Scoping Reply	Summary of Scoping Comment
An Taisce	No response	No response
Bat Conservation Ireland	No response	No response
BirdWatch Ireland	16.02.2024	Requested environmental monitoring reports since the initiation of the wind farm with particular refence to bird monitoring reports. Highlighted Hen Harrier Threat response plan
Butterfly Conservation Ireland (BCI)	No response	No response
Commission for Regulation of Utilities , Water and Energy	No response	No response
Cork Airport	19.08.2024	Automated response
Cork County Council-Environment	01.03.2024	The EIA should document and assess current noise environment and operational noise impact of the proposed development on receiving environment and sensitive receptors. Full descriptive details of all monitoring locations, calculations, assumptions and mitigations. Include assessment of the efficiency of all mitigation measures claimed during original application vis a vis noise, shadow flicker, surface water controls etc. Changes in habitats should be documented including downstream Q values compared to predevelopment Q values.

Consultee Name	Scoping Reply	Summary of Scoping Comment
		Assessment of the change in conservational and/or environmental objectives for sites the development influences. Include an assessment of the impact on bird populations resulting from the developments operational phase, with expert evidence of impact to support continued operations. EIA should provide for the decommissioning phase etc to ensure no legacy waste issues and/or return insofar as precritical to original undisturbed/greenfield state.
Cork County Council – Roads	No response	No response
Cork County Council- Heritage	13.03.2024	Along with addressing landscape and built heritage matters the EIAR shall address the potential impacts of the development upon archaeological heritage and features in the area. The applicant should note Policy Objective HE 16-9 of the County Development Plan 2022 (Archaeology and Infrastructure Schemes) requires that all large-scale planning applications (i.e. development of lands on 0.5 ha or more in area or 1km or more in length) are subjected to an archaeological assessment as part of the planning application process which should comply with the Department of Arts, Heritage and the Gaeltacht's codes of practice. It is recommended that the assessment is carried out following pre-planning consultation with the County Archaeologist, by an appropriately experienced archaeologist to guide the design and layout of the proposed scheme/development, safeguarding the archaeological heritage in line with Development Management Guidelines. Archaeology includes the protection of Archaeological Sites and Recorded Monuments and the assessment of effects of the development upon same should be detailed within the EIAR. The applicant should note the objectives of the CDP 2022 in relation to Archaeology including HE16-9, 16-11, and 16-13.
Cork County Council - Planning	16.02.2024	Acknowledgement of email only
Department of Agriculture, Food and the Marine	14.03.2024	Response received from felling division- The developer should take note of the contents of Felling and Reforestation Policy document which provide a consolidated source of information on the legal and regulatory framework relating to tree felling; It is important to note that when applying to a Local Authority, or An Coimisiún Pleanála, for planning permission where developments are: a) subject to an EIA procedure (including screening in the case of a sub-threshold development) and any resulting requirement to produce an EIAR; and/or b) subject to an Appropriate Assessment procedure (including screening) and any resulting requirement to a Natura Impact Statement (NIS); and c) the proposed development in its construction or operational phases, or any works ancillary thereto,

Consultee Name	Scoping Reply	Summary of Scoping Comment
		would directly or indirectly involve the felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species, 1. that there is a requirement inter alia under the EIA Directive for an overall assessment of the effects of the project or the alteration thereof on the environment to be undertaken, including the direct and indirect environmental impact of the project; and 2. pursuant to Article 2(3) of the EIA Directive, the Department of Agriculture, Food and the Marine strongly recommends that, notwithstanding the fact that a parallel consent in the form of felling licence may also have to be applied for, any EIAR and/or NIS produced in connection with the application for planning permission to the Local Planning Authority or An Coimisiún Pleanála, should include an assessment of the impact of and measures, as appropriate, to prevent, mitigate or compensate for any significant adverse effects direct or indirect identified on the environment arising from such felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species. 3. Please note that there must be absolute spatial consistency between the felling licence areas submitted to DAFM (second authority) and all related planning documents submitted to the first authority in respect of the felling area(s)
Department of Communications, Climate Action and the Environment	No response	No response
Department of Defence	29.08.2024	All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near InfraRed (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light. Any Irish Air Corps (IAC) requirements for are separate to Irish Aviation Authority (IAA) require. Request that they are kept informed on any progress relating to this proposed development.
Department of Housing, Local Government and Heritage	16.02.2024	Acknowledgement of receipt (ref: GPre00066/2024) only
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	No response	No response

Consultee Name	Scoping Reply	Summary of Scoping Comment
Department of Transport, Tourism & Sport	27.02.2024	No observations
EirGrid	No response	No response
Environmental Protection Agency	No response	No response
Failte Ireland	14.03.2024	Issued a copy of Fáilte Ireland's Guidelines for the Treatment of Tourism in an EIA. These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines outlined in section 2.
Forest Service	14.03.2024	If the proposed development will involve the felling or removal of any trees, the developer must obtain a Felling License from this Department before trees are felled or removed. A Felling Licence application form can be obtained from Felling Section, Department of Agriculture, Food and the Marine. A Felling Licence granted by the Minister for Agriculture, Food and the Marine provides authority under the Forestry Act 2014 to fell or otherwise remove a tree or trees and/or to thin a forest for silvicultural reasons. The developer should take note of the contents of Felling and Reforestation Policy document which provide a consolidated source of information on the legal and regulatory framework relating to tree felling; gov.ie - Tree Felling Licences (www.gov.ie) As this development is within forest lands, particular attention should be paid to deforestation, turbulence felling and the requirement to afforest alternative lands. It is important to note that when applying to a Local Authority, or An Coimisiún Pleanála, for planning permission where developments are: a) subject to an EIA procedure (including screening in the case of a sub-threshold development) and any resulting requirement to produce an EIAR; and/or b) subject to an Appropriate Assessment procedure (including screening) and any resulting requirement to a Natura Impact Statement (NIS); and c) the proposed development in its construction or operational phases, or any works ancillary thereto, would directly or indirectly involve the felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species, 1. that there is a requirement inter alia under the EIA Directive for an overall assessment of the effects of the project or the alteration thereof on the environment to be undertaken, including the direct and indirect environmental impact of the project; and 2. pursuant to Article 2(3) of the EIA Directive, the Department of Agriculture, Food and the Marine strongly recommends that, notwithstanding the fact that a parallel consent in the form of felling licence may also have to be applied for, any EIAR and/or NIS produced in connection with the application for planning permission to the Local Planning Authority or An

Consultee Name	Scoping Reply	Summary of Scoping Comment
		Coimisiún Pleanála, should include an assessment of the impact of and measures, as appropriate, to prevent, mitigate or compensate for any significant adverse effects direct or indirect identified on the environment arising from such felling and replanting of trees, deforestation for the purposes of conversion to another type of land use, or replacement of broadleaf high forest by conifer species. 3. Please note that there must be absolute spatial consistency between the felling licence areas submitted to DAFM (second authority) and all related planning documents submitted to the first authority in respect of the felling area(s)
Geological Survey of Ireland	06.03.2024	Recommended to review data available on the GSI website. Records show that there are no unaudited CGSs in the vicinity of the proposed wind farm extension. The Groundwater Data Viewer indicates an aquifer classed as a 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones' underlies the wind farm development. The Groundwater Vulnerability map indicates the range of groundwater vulnerabilities within the area covered is variable. We would therefore recommend use of the Groundwater Viewer to identify areas of High to Extreme Vulnerability and 'Rock at or near surface' in your assessments, as any groundwater-surface water interactions that might occur would be greatest in these areas. The Landslide Susceptibility Viewer indicates areas of Moderately High to High Susceptibility within the vicinity of the wind farm area. Should development go ahead, the GIS would appreciate a copy of reports detailing any site investigations carried out.
Health Service Executive	20.03.2024	The following documents should be taken into consideration when preparing the Environmental Impact Assessment Report: • Guidelines on the information to be contained in EIS (2002), • Advice Notes on Current Practice in the preparation of EIS (2003), • Guidelines for Planning Authorities and An Coimisiún Pleanála on carrying out Environmental Impact Assessment Recommends that the following matters are included and assessed in the EIAR: (additional detail provided in response) • Public Consultation • Population and Human Health • Water (Hydrology and Hydrogeology) • Land and Soils • Air, Dust and Odour • Climate Change and Opportunity for Health Gain • Noise and Vibration • Waste Management

Consultee Name	Scoping Reply	Summary of Scoping Comment
		• Ancillary Facilities • Cumulative Impacts
Iarnród Éireann	22.08.2024	No comments
Inland Fisheries Ireland	No response	No response
Irish Aviation Authority	16.02.02024; 22.03.2024	16.02.2024- queried lighting on existing turbines. MKO reverted to this query on the 08.03.2024 confirming that lighting on T11 is as per previous IAA guidelines. 22.03.2024- formal response received from IAA requested new lighting around geographical perimeter of the site
Irish Peatland Conservation Council	No response	No response
Irish Red Grouse Conservation trust	No response	No response
Irish Raptor Study Group	No response	No response
Sport Ireland	No response	No response
Irish Wildlife Trust	21.02.2024	Low staff capacity - unable to comment
Kerry Airport	No response	No response
Office of Public Works	No response	No response
Southern Regional Assembly	16.02.2024	Acknowledgment of email only
Sustainable Energy Authority of Ireland	19.08.2024	Acknowledgement of email only
SW Local Authority Waters Programme	No response	No response
The Arts Council	No response	No response
The Heritage Council	No response	No response
Transport Infrastructure Ireland	01.03.2024	With respect to EIAR scoping issues, a series of recommendations were provided as general guidance for the preparation of an EIAR, which may affect the national road network. The developer/scheme promoter should have regard, inter alia, to the following: - Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to the locations of existing and future national road schemes. - Potential significant impacts arising from the development and haul route on the national road network - The developer, in preparing EIAR, should have regard to TII Publications (formerly 'DMRB' and the 'Manual of Contract Documents for Road Works'). -The EIAR/EIS should consider the 'Environmental Noise Regulations 2006' (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. Noise barriers may need to be considered. - A Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's TTA Guidelines' (2014) should be referred.

Consultee Name	Scoping Reply	Summary of Scoping Comment
		Attention is drawn to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA. - The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required. - The EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network. - In relation to any proposed haul route, where abnormal 'weight' loads are proposed, separate structure approvals/permits and other licences may be required. The applicant/developer should also consult with all PPP Companies, MMaRC Contractors and road authorities over which the haul route traverses to ensure the network is safeguarded.
Uisce Éireann	07.03.2024	Generic recommendations, including: a) Drinking Water Source(s) b) Where backfilling of materials is proposed, a waste sampling strategy to ensure the material is inert is required. c) Mitigation measures with regards potential negative impacts on any water source(s) d) Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/ surface water interactions. e) Impacts of the development on the capacity of water services f) The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development. g) The management of surface water h) Any physical impact on Uisce Éireann assets i) Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce Éireann discharge outfalls including changes in dispersion / circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report. j) Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water)
Waterways Ireland	15.02.2024	Noted that the site is not in a zone of notification
Telecoms		
2RN (RTÉ Transmission Network DAC)	20.11.2023	If no change to existing wind farm then no interference is expected
Coimisiún na Meán (formerly Broadcasting Authority of Ireland)	30.11.2023	No awareness of issues from existing wind farms on existing FM networks. The turbines are not located close to any existing or planned FM transmission sites.
Cellnex	19.12.2023	One telecoms installation in the affected area - Meentinny CIG-00316. (Lat – 52.27887, Long - -9.09287) The links on the tower are owned by –

Consultee Name	Scoping Reply	Summary of Scoping Comment
		• Three Ireland – ComReg Reference – CK0176 • Vodafone – ComReg Reference – CK040 • Imagine – ComReg Reference – CK137 • Eir – ComReg Reference – CK_3202 • Tetra – ComReg Reference - 512
Dense air	No response	No response
Eircom Ltd	01.12.2023	No transmission links in the area and no risk to the network
Electricity Supply Board	20.05.2025	The development has been thoroughly reviewed and cleared.
Enet Telecommunications Networks Limited	20.11.2023	No links in the area
EOBO Ltd	No response	No response
FastCom Broadband Limited	No response	No response
Hibernian towers	11.01.2024	No objection
Imagine Networks Services	21.11.2023	No microwave links affected by the development
Irish Rail	21.11.2023	Not within the GSM-R exclusion zone.
Ivertec Ltd	20.11.2023	The development will not impact on the network
JFK Communications Ltd	11.12.2023	No links in the area
JS Whizzy Internet Limited	04.03.2024	No links in the area.
Lackabeha Services Ltd T/A Airwaves Internet	No response	No response
RTÉ/Saorview	20.11.2023	No links present
TETRA Ireland	No response	No response
Three Ireland (Hutchison) Ltd	20.11.2023	No effect on the transmission network.
Towercom	21.11.2023	No links in the area.
Viatel Ireland Ltd	No response	No response
Virgin media	20.11.2023	No impact on current wireless network
Vodafone Ireland Ltd	30.11.2023	No links in the area.
Western Broadband Network	20.11.2023	No infrastructure in the area.

2.11 Other Engagement

2.11.1 Community Engagement

In preparation for the public consultation, conducted by the Applicant, a Community Liaison Strategy (CLS) was developed by the Community Engagement Team. The CLS involved desk research on the local area including research on the 2022 Census figures and the County and Local Development Plans. This research was undertaken in order to gain an understanding of the local heritage, people and business environment. The CLS is based on the 'Code of Practice for Wind Energy Development in Ireland Guidelines for Community Engagement' and the Aarhus Convention.

A Community Liaison Officer (CLO) was appointed for the project in August 2023 to act as the main point of contact to the local community. The appointment of a dedicated CLO was crucial to ensure effective communication and foster trust between the Applicant and the local residents.

Public consultation for the project comprised of two rounds of engagement where the CLO and a member of the Community Liaison Team called to households in the local area. The intention of the visits to households was for the CLO and the Community Liaison Team to introduce themselves and the Applicant to the individuals locally, to establish a line of dialogue with local residents, informing them of the acquisition of the existing wind farm by the Applicant and outlining the details of the Proposed Lifetime Extension .

The first round of engagement was conducted in June 2024 and comprised of door-to-door engagement with residents living around the 1km radius of the Taurbeg Wind Farm. A dedicated project booklet and an introductory booklet to the Applicant were provided to residents during this round of consultation. A project-specific website (www.taurbegwindfarm.ie) was also established.

The second consultation round was conducted in May 2025 and consisted of further door-to-door engagement and a letter drop to residents living around the 1km radius of the Taurbeg Wind Farm. The intention of this round of consultation was to provide further details on the Proposed Lifetime Extension and the extension of the Proposed Lifetime Extension from 9 years to 10 years which was previously presented, informing residents of the upcoming planning application submission date, details on how to access the planning application documents online once submitted and to gain further feedback from the local community.

During the consultation with the local community contact details in the form of a contact phone number and email address for enquiries were distributed. A contact and feedback facility are also included on the project website.

The project website displays up to date information on the Proposed Lifetime Extension. While the initial aim of the project website is to provide context for the project, develop a greater understanding on the need for renewable energy development, provide project information and advice on the consultation approach, the Project Website will evolve with the project to provide a source of updated information as the project progresses.

Feedback from the consultation rounds were passed on to the Project Team. Where areas of concern or interest were expressed, every effort was made to not only provide accurate information but also to guide the individuals concerned towards sources of accurate information to assist them in the process of informing themselves. The main issues and queries that arose during the consultation with the local community included the Proposed Lifetime Extension and planning application, the Community Benefit Fund, the potential for noise impacts and battery storage (which does not form part of the proposal). Follow-up phone calls on topics were undertaken where required.

Over the course of engagement with the local community/individuals and community groups feedback was actively sought on the Community Benefit Fund. The Community Benefit Fund is currently €23,000 per year and will increase by 2% annually over the 10-year lifetime extension period which will amount to approximately €290,000. Community groups in the vicinity of the project were also contacted to inform them of the project acquisition by the Applicant, details of the Proposed Lifetime Extension and to make assurances that Community Benefit funding would be continued and increased where a grant of planning permission for the Proposed Lifetime Extension is secured.

Rockchapel village contains a national school, community centre and GAA club – all of which have benefited from the Taurbeg Wind Farm Community Benefit Fund over the last 20 years of operation. Over the 20-year period the fund has provided the following:

- Assisted in the creation of a creche/playground in Rockchapel village;
- Provided funding to the local GAA Club;
- Provided funding for maintenance and improvements to the Taur church;
- Assisted with renovation works at the old Glash school which became a community centre; and
- Provided funding for improvements to the Rockchapel National School and the Knocknaclarig National School.

The wind farm was also previously opened to a number of school groups from surrounding settlements and villages. This was part of commitments made in the original planning application for the wind farm.

The Applicant facilitated an initiative with Wind Energy Ireland on the 28th November 2024, where students from Rockchapel National School visited Taurbeg and were given a tour of the wind farm.

Following this, a representative from the applicants Operations Team also visited Rockchapel National School giving a presentation on wind energy and how it contributes to the local community. There was positive engagement from the school on both occasions. There was also very positive feedback from the class and teacher about the wind farms in the area, and how they contribute to local initiatives. The project will continue to be used to inform how best we can educate school children on the benefits of wind energy.

The approach to consultation with the community is to engage in an open, honest and transparent manner with the aim to not only provide clear and understandable information but also to gain feedback to understand the views of the local community. A Community Engagement Report is included in Appendix 2-2 of this EIAR.

2.11.2 Pre-Planning Engagement

Cork County Council

First Pre-Planning Meeting

A pre-application meeting request was issued to CCC in accordance with Section 247 of the Planning and Development Act 2000, as amended, in February 2024. The request provided detail as to the background of the development, the proposal under consideration and current policy context at European, national, regional and local levels.

A pre-application meeting was duly held on the 27th of March 2024 via MS Teams. Those in attendance were:

On behalf of Cork County Council:

- Bryan Riney - Senior Planner
- Louise Ahern - Senior Executive Planner
- Sharon Casey - Ecologist
- Ian McDermott – Ecologist

On behalf of Agent and Applicant

- Padraig Cregg - MKO
- Meabhann Crowe - MKO
- Eoin McCarthy – MKO
- Claire Walsh – Taurbeg Ltd (the prospective applicant)

A pre-application PowerPoint presentation was delivered by the project team. It was noted that the existing wind farm, comprising 11 no. wind turbines, became operational in March 2006. Planning Condition no. 7 of the grant of permission issued for the wind farm (Pl. Ref: 02/3608) states: *"The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development. Reason: In the interest of planning and the sustainable development of the area.*" It was noted that the original application for the wind farm was made in 2003, prior to the designation of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protection Area in 2012 and as such naturally the development could not at that time have been assessed in light of the conservation objectives for the site. The site is now located in a 'Normally Discouraged' zoning area for wind development where Development Plan Objective ET 13-8 of the Cork County Development Plan 2022 applies.

The discussion centred largely around the ecological matters pertaining to the site. The Planning Authority highlighted that the Special Protection Area (SPA) is designated for the protection of the Bird Directive Annex I species Hen Harrier, whose population is in decline.

The Planning Authority noted that must be certain beyond all reasonable scientific doubt, the project will not give rise to adverse effects on the integrity of any EU site. The Authority noted that the Applicant may need to explore the route of derogation from compliance with the Habitats Directive (Article 6.4 derogation) to secure a planning consent for extension of life of the wind farm.

Second Pre-Planning Meeting

A second meeting was held with Cork County Council on the 10th of February 2025 to update the Authority on the progress of the application. The meeting was held virtually, via Microsoft Teams. The following were in attendance:

On behalf of Cork County Council:

- Bryan Riney - Senior Planner
- Louise Ahern - Senior Executive Planner
- Sharon Casey - Ecologist
- Ian McDermott – Ecologist

On behalf of Agent and Applicant

- Crystal Leiker – Taurbeg Ltd (prospective applicant)
- Padraig Cregg - MKO
- Meabhann Crowe - MKO
- Eoin McCarthy – MKO
- Natalia Stolarska - MKO

A pre-application PowerPoint presentation was delivered by the project team. It provided a recap on the proposal to extend the operational life of the wind farm, and provided more detail on the Proposed Offsetting Measures, to be the subject of a planning application to Kerry County Council.

The discussion centred largely around the ornithological considerations pertaining to the site. MKO noted the fact that the planning strategy would be based on reliance on the "Imperative Reasons of Overriding Public Interest" (IROPI[7]) mechanism of the Habitats Directive. The MKO team explained to CCC that Proposed Offsetting lands have been identified in County Kerry within the SPA, approximately 11km from the Site. The Proposed Offsetting lands identified are located within the SPA. For clarity, the Offsetting lands site identification process did not identify suitable and/or available lands of sufficient quantity within Co. Cork within the SPA.

The Authority queried the timing of the applications to Cork and Kerry County Council , their ability to adjudicate on the application, and the guidance contained within document the European Commission's *Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (2021/C 437/01)* with regards location of the Proposed Offsetting lands.

MKO agreed to review the points raised by the Authority and revert should any further queries arise. MKO also highlighted the benefits of both Kerry and Cork County Councils, as respective Planning Authorities, to liaise when both applications are with them for determination.

[7] 1 The Habitats Directive (and Irish legislation) does provide for very limited circumstances where, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless proceed for imperative reasons of overriding public interest (Article 6(4)). This is referred to as IROPI and remains rare in Ireland although it is more common in other member states.

National Parks and Wildlife Service

First NPWS Meeting

A meeting between the Applicant, MKO and the NPWS took place on the 30th of April 2024 via MS Teams. Those in attendance were:

- Applicant – Claire Walsh (CW), Cathal Gallagher (CG)
- MKO - Eoin McCarthy (EM), Padraig Cregg (PC), Pat Roberts (PR)
- NPWS – Stefan Jones (SJ), Declan O'Donnell (DOD)

Short presentation with slide deck provided by MKO and The Applicant

- Introduction of Proposal the Applicant and Project Team
- Site Location
- Existing Taurbeg Wind Farm Design
- Planning Policy Context
- Site Constraints, Environmental Designations, Habitats
- Ornithological and Ecological Survey Scope
- Wind Farms in SPAs

A summary of the meeting is set out below:

- PC confirmed that one day of carcass searching being undertaken per month and data will be extrapolated. No finds to date. MKO to take account of 43 minute removal time, while noting that carcass removal time is site specific.
- PC confirmed that the most relevant guidance (SNH) for surveying of existing WFs (for repowering applications) requires a minimum of 12 months but we have committed to 18 months for the Taurbeg WF Lifetime Extension project given its location within an SPA
- NPWS confirmed that no national approach/strategy for lifetime extensions of wind farms within SPAs exists.
- DOD suggested that MKO/the Applicant should engage with the Birds Unit within the NPWS,
- With regards offsetting, PC referred to a number of projects that have Hen Harrier Management/Habitat Enhancement Plans which can select from a menu of options (e.g. farmland management, forestry management, forestry felling, restoration of peatland). Referenced HH Project. It was noted also that the wind farm industry is a relatively young industry and therefore, these measures are very new.
- It was acknowledged by NPWS that a lifetime extension project carries much lower environmental risk compared to a repowering application.
- The NPWS considered the project could constitute as an IROPI project.
- MKO sought an on-site meeting with NPWS.

Second NPWS Meeting

A meeting between the Applicant, MKO and the NPWS took place on the 29th of May 2025 via MS Teams. Those in attendance were:

- Applicant – Crystal Leiker (CL), Cathal Gallagher (CG)
- MKO – Eoin McCarthy (EM), Natalia Stolarska (NS), Padraig Cregg (PC), Pat Roberts (PR), Donnacha Woods (DW), Sean Creedon (SC)
- NPWS – Paul Scott (PS), Cliona O'Brien (CO), Malachy Corcoran (MC), Jarvis Good (JG), Stefan Jones (SJ)

A short presentation with slide deck provided by MKO and the Applicant included:

- An overview of the Proposal, the Applicant and the Project Team
- Site Location
- Existing Taurbeg Wind Farm Design
- Planning Policy Context
- Environmental Designation, Appropriate Assessment and IROPI
- Proposed Offsetting Measures

A summary of the meeting is set out below:

- EM confirmed that a planning application to KCC for the Proposed Offsetting Measures will be submitted concurrently with the planning application to CCC for the Proposed Lifetime Extension.
- PC stated that the Proposed Offsetting Measures will significantly enhance its value for Hen Harrier foraging.
- PC stated the Proposed Offsetting Measures are permanent and under the ownership and management of the Applicant. Monitoring and adaptive management are planned.
- PC stated that the Proposed Offsetting Lands were chosen based on availability and suitability, along with habitat quality and land ownership.
- The NPWS provided some useful feedback on the Proposed Offsetting Measures and advised on where improvements could be made to benefit Hen Harrier.
- The NPWS acknowledged that renewable energy developments fall under IROPI.

The Applicant and MKO expressed a strong desire for a collaborative process with the NPWS post-submission, PS of the NPWS agreed with this.

2.12 Cumulative Impact Assessment

The EIA Directive and associated guidance documents state that as well as considering any direct, indirect, secondary, transboundary, short, medium, and long term, permanent and temporary, positive and negative effects of the project the description of likely significant effects should include an assessment of cumulative impacts that may arise. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project. The factors to be considered in relation to cumulative effects include population and human health, biodiversity, land, soil, water, air, climate, material assets, landscape, and cultural heritage as well as the interactions between these factors.

To gather a comprehensive view of cumulative impacts on these environmental considerations and to inform the EIAR process being undertaken by the consenting authority, each relevant chapter within this EIAR includes a cumulative impact assessment where appropriate.

The potential for cumulative impacts arising from other projects has therefore been fully considered within this EIAR.

2.12.1 Methodology for the Cumulative Assessment of Projects

The potential cumulative impact of the Proposed Project and combined with the potential impact of other projects has been carried out with the purpose of identifying what influence the Proposed Project will have on the surrounding environment when considered collectively with approved and existing projects, projects pending a decision from the planning authority and land-uses in the defined cumulative assessment study areas as set out in Table 2-7 below.

The cumulative impact assessment of projects has three principle aims:

- To establish the range and nature of existing and approved projects within the cumulative impact study area of the Proposed Project.
- To summarise the relevant projects which have a potential to create cumulative impacts.
- To identify the projects that hold the potential for cumulative interaction within the context of the Proposed Project and discard projects that will neither directly or indirectly contribute to cumulative impacts. (Note: this is carried out by individual experts with respect to their specialist area of expertise.)

Projects were identified through a search of relevant online planning registers and effects were considered following a review of associated EIARs.

2.12.2 Cumulative Study Area

Table 2-7 below details the cumulative assessment study areas, relative to the Proposed Project, which are considered in this EIAR. Following consultation with the EIAR team on each individual topic, the maximum geographical extent where there is potential for in combination effects/cumulative impact, and justification for this extent was established and is presented below. A long list of projects considered across all disciplines in their cumulative impact assessment is included in Appendix 2-3 of this EIAR.

Table 2-7: Cumulative Study Area and Justification

Individual Topic	Maximum Extent	Justification
Population & Human Health (including shadow flicker)	Population Study Area (Clonfert East Electoral Division) Shadow Flicker Study Area (10x RD buffer of the turbines RD from existing turbine locations = 824m) Consideration for the Population & Human Health cumulative extent is also given to Air Quality, Climate, Noise, and Landscape and Visual (i.e., Residential Visual Amenity) Cumulative study areas.	The Study Areas for Population and Human Health are identified in Section 5.2.1 in Chapter 5 as the Electoral Divisions within which the Project is located. For the assessment of cumulative shadow flicker, any other existing, permitted or proposed wind farms are considered where their 10x rotor diameter buffer zones overlap the Shadow Flicker Study Area of 824m (ten times the rotor diameter from existing turbines) for the Proposed Lifetime Extension.
Biodiversity	Terrestrial Habitat and Species – 1km of Site and Offsetting Lands	All projects within this 1km buffer of the Site and Proposed Offsetting Lands were considered when completing the cumulative assessment for terrestrial biodiversity. The geographical boundaries were chosen because of the common nature of the habitats recorded within the Site, which mostly comprises upland blanket bog, wet grassland, conifer plantations and heath habitats, and the Proposed Offsetting

Individual Topic	Maximum Extent	Justification
	Aquatic Habitats and Species - Hydrological catchment area	Lands, which mostly comprises managed agricultural grassland and commercial forestry. The cumulative hydrological study area for hydrology and hydrogeology has also been applied to flora and fauna due to potential hydrological connectivity across the catchment.
Birds	Wind farms within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA plus 5km radius.	The Proposed Lifetime Extension was considered in the context of other wind farms, existing and approved planning applications, in the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA plus a 5km radius that could result in cumulative impacts on birds.
Biodiversity - Bats	10km from the existing Taurbeg Wind Farm turbines	A 10km buffer of the existing turbines is used as recommended for the desktop study and cumulative assessment by NatureScot Guidelines 2021 (Section 4).
Land, Soils and Geology	EIAR Site Boundary	There is no potential for significant cumulative effects in-combination with other local developments on the land, soils and geology environment outside of the EIAR site boundary.
Hydrology & Hydrogeology	Hydrological catchment area	A cumulative hydrological study area has been delineated as follows: › The north of the site is located in the Tralee Bay Feale Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects on the Feale River

Individual Topic	Maximum Extent	Justification
		downstream of EPA Hydrotool Node: 23_1771 (Total Upstream Catchment Area of ~95km2). › The south of the site is located in the Blackwater (Munster) Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects downstream of EPA Hydrotool Node: 18_2469 on the Glenlara River. This Node is located ~2km upstream of the confluence of the Glenlara and Allow Rivers. In order to be conservative and for completeness, the cumulative study area extends downstream as far as Node 18_1756 which includes the entire catchment of the Glenlara River (Total Upstream Catchment Area of ~139km2). Based on the above the delineated hydrological cumulative study area is ~234km2.
Air Quality	Air Quality Study Area is 1km from existing Taurbeg Wind Farm turbines	Given dust particles do not generally travel greater than 500m from source (Guidance on the Assessment of Mineral Dust Impacts for Planning, IAQM 2024) the geographical boundary for the cumulative dust impact is 500m. In line with the TII Publication Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107, December 2022, a geographical boundary of 1km was used for cumulative air quality assessment.

Individual Topic	Maximum Extent	Justification
Climate	The Climate assessment has been considered on a national basis and not confined to a specific study area.	The Climate assessment has considered the cumulative effects of the Proposed Project with other developments on a national basis under the relevant national Sectoral Emissions Ceilings.
Noise and Vibration	The list of wind farms which were initially considered in cumulative assessment extended to 20 km	Due to the potential for cumulative effects with other existing wind farm developments, the study area for the Proposed Lifetime Extension covers at a minimum the area predicted to exceed 30 dB L_{A90} at the maximum predicted noise emission level for the Taurbeg Turbines isolation (Institute of Acoustics document Good Practice Guide To The Application Of Etsu-R-97 For The Assessment And Rating Of Wind Turbine Noise).
Archaeological, Architectural and Cultural Heritage	2km from existing Taurbeg Wind Farm turbines	Cumulative impacts on setting are more likely to occur at the operational stage of the development (i.e. post construction). In this regard in order to assess overall cumulative effects on archaeology and cultural heritage, the Proposed Lifetime Extension is considered in the context of other developments, in particular other permitted and proposed wind farms within 2km of the Proposed Lifetime Extension.
Landscape & Visual	20km from the existing Taurbeg Wind Farm turbines for visual and landscape effects. 15km from the existing Taurbeg Wind Farm turbines for effects on landscape character	The Wind Energy Development Guidelines (DoEHLG, 2006) ('the Guidelines') require that "in areas where landscapes of national or international renown are located within 25 km of a proposed wind energy development, the Zone of Theoretical Visibility should be extended as far (and in the direction of) that landscape".

Individual Topic	Maximum Extent	Justification
		There are no landscapes of national or international renown within 25km of the Proposed Lifetime Extension, and therefore the cumulative boundary for visual and landscape effects is reduced to 20km from the Proposed Lifetime Extension. This LVIA Study Area of 20km for landscape and visual effects as is suggested by guidance: "For blade tips in excess of 100m, a Zone of Theoretical Visibility radius of 20km would be adequate" (WEDGs Page 94, DoEHLG, 2006; Page 152, DoHPLG, 2019). The Landscape Character Areas (LCA) study area has been chosen as 15 kilometres for effects on landscape character. Through experience conducting LVIA for other wind energy development projects, the assessment team determined that no significant effects on landscape character are likely to arise beyond distances of 15km from the existing turbines. Therefore, a LCA Study Area of 15km is deemed appropriate for effects on landscape character in relation to the assessment of effects upon designated Landscape Character Areas
Material Assets: Traffic & Transport	1km from the EIAR Site Boundary	Given the nature of the Project (i.e. no construction or groundworks proposed), it was determined that this buffer was suitable for the cumulative assessment.
Material Assets: Telecoms, Aviation and Other Utilities	20km for Telecoms and Aviation.	The geographical boundary for the telecoms cumulative assessment is defined by the

Individual Topic	Maximum Extent	Justification
	EIAR Site Boundary for other utilities.	potential for other wind farm projects to interfere with broadcast signals that interact with the Proposed Lifetime Extension.

2.12.2.1 Other Developments/Land Uses

The review of the relevant County Council planning registers documented relevant general development planning applications in the vicinity of the Proposed Lifetime Extension, the majority of which relate to the provision and/or alteration of one-off rural housing and the provision of agricultural buildings. These applications and land uses have also been taken account in describing the baseline environment and in the relevant assessments.

Furthermore, the cumulative impact assessments carried out in each of the subsequent chapters of this EIAR consider all potential significant cumulative effects arising from all land uses in the vicinity of the Proposed Project. These include permitted and existing wind farms in the area, solar farms, ongoing agricultural practices/forestry practices, quarries and extractive industries, intensive production/ processing industries, large infrastructure projects and other EIAR projects. The OPW (www.floodinfo.ie) does not record the presence of any Arterial Drainage Schemes or Benefited Lands within the Site.

Overall, the mitigation measures set out in this EIAR will ensure that significant cumulative effects do not arise during the extended operational or decommissioning phases of the Proposed Project. Additional detail in relation to the potential significant cumulative effects arising and, where appropriate, the specific suite of relevant mitigation measures proposed are set out within each of the relevant chapters of this EIAR.

2.12.2.2 Summary

The cumulative impact assessments carried out in each of the subsequent chapters of this EIAR consider all potential significant cumulative effects arising from relevant projects and land uses within the cumulative study area. These include ongoing agricultural and forestry practices.

Overall, the suite of mitigation measures is set out within the EIAR. Additional detail in relation to the potential significant cumulative effects arising and, where appropriate, the specific suite of relevant mitigation measures proposed are set out within each of the relevant chapters of this EIAR.

APPENDIX 1

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Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 3 – Consideration of Reasonable Alternatives

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3. CONSIDERATION OF REASONABLE ALTERNATIVES

3.1 Introduction

Article 5(1)(d) of Directive 2011/92/EU[1] of the European Parliament and of the Council of 13 December 2011 on the assessment of effects of certain public and private projects on the environment (codification), as amended by Directive 2014/52/EU[2] (the EIA Directive), requires that the Environmental Impact Assessment Report (EIAR) contains "*a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.*"

Article 5(1)(f) of the EIA Directive requires that the EIAR contains "*any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.*"

Annex IV of the EIA Directive states that the information provided in an EIAR should include a "*description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.*"

This section of the EIAR contains a description of the reasonable alternatives that were studied by the Applicant, which are relevant to the Proposed Project and its specific characteristics, in terms of site location and other renewable energy technologies as well as site layout incorporating size and scale of the project. It provides an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

It is important to note that Taurbeg Wind Farm is existing infrastructure that has been operating and supplying electricity to the national grid since 2006. This EIAR has been prepared for the proposal to extend the operational lifespan of Taurbeg Wind Farm, beyond 2026, for a further 10 years (the 'Proposed Lifetime Extension'). No construction or groundworks are proposed as part of the Proposed Lifetime Extension.

The consideration of alternatives is an effective means of avoiding environmental impacts. As set out in the '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022)*[3]*, the presentation and* consideration of reasonable alternatives investigated is an important part of the overall EIA process. The factors of hierarchy, non-environmental factors and site-specific issues may be taken into account in the consideration of reasonable alternatives, as set out below.

Hierarchy

EIA is concerned with projects. The Environmental Protection Agency (EPA) 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, May 2022), state that

[1] *European Union (2011). Directive 2011/92/EU. European Parliament and European Council.*
[2] *European Union (2014). Directive 2014/52/EU. European Parliament and European Council.*
[3] *Environmental Protection Agency (2022): Guidelines on the Information to be contained in Environmental Impact Assessment Reports. EPA, Wexford. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf*

in some instances neither the applicant nor the competent authority can be realistically expected to examine options that have already been previously determined by means of a Strategic Environmental Assessment (SEA), the higher tier form of environmental assessment.

Non-Environmental Factors

EIA is confined to the potential significant environmental effects that influence consideration of alternatives. However, other non-environmental factors may have equal or overriding importance to the developer of a project, for example project economics, land availability, engineering feasibility or planning considerations.

Site-Specific Issues

The EPA guidelines state that the consideration of alternatives needs to be set within the parameters of the availability of the land, i.e. the site may be the only suitable land available to the developer, or the need for the project to accommodate demands or opportunities that are site-specific. Such considerations should be on the basis of alternatives within a site, for example design and layout.

3.1.2 Methodology

The European Commission's *'Guidance on the Preparation of the Environmental Impact Assessment Report'* (EU, 2017)[4] outlines the requirements of the EIA Directive and states that, in order to address the assessment of reasonable alternatives, the developer needs to provide the following:

- A description of the reasonable alternatives studied; and
- An indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

There is limited European and National guidance on what constitutes a 'reasonable alternative' however the EU Guidance Document (EU, 2017) states that reasonable alternatives "*must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives*".

The guidance also acknowledges that "*the selection of alternatives is limited in terms of feasibility. On the one hand, an alternative should not be ruled out simply because it would cause inconvenience or cost to the Developer. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative.*"

The EPA Guidelines (EPA, 2022) state that "*It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.*"

Consequently, taking consideration of the legislation and guidance requirements into account, this section addresses alternatives under the following headings:

- 'Do-Nothing' Alternative;
- Alternative Locations;
- Alternative Processes;
- Alternative Technologies;
- Alternative Turbine Layouts and Development Design
- Alternative Mitigation Measures.

[4] *European Union (2017) Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU).*

Each of these is addressed in the following sections.

3.2 'Do-Nothing' Alternative

Article IV, Part 3 of the EIA Directive states that the EIAR should include "*an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.*" This is referred to as the "*Do-Nothing*" alternative. EU guidance (EU, 2017) states that this should involve the assessment of "*an outline of what is likely to happen to the environment should the Project not be implemented – the so-called 'do-nothing' scenario.*"

The existing Taurbeg Wind Farm has been operational since March 2006, with the current planning permission set to expire in 2026. Planning condition no. 7 of the existing permission (Cork Co. Co. Pl. Ref. N/2002/3608) states that:

> "*The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development.*"

The 'Do-Nothing' alternative with regard to the Proposed Lifetime Extension, is to decommission the existing wind farm in 2026 when the current permission expires. As part of the decommissioning stage, the existing turbines would be dismantled, and all associated access roads, hardstands and turbine foundations removed; please see Section 4.7 in Chapter 4 of this EIAR for further details regarding decommissioning. The Proposed Lifetime Extension seeks to extend the operational life of the existing wind farm to 2036, at which stage the wind farm would be decommissioned.

Decommissioning activities have evolved since the original planning application was submitted and a Decommissioning Plan has been prepared to account for such updates and is included in Appendix 4-3 of this EIAR. The removal of the wind farm infrastructure such as turbine foundations and site roads under the 'Do Nothing' alternative is not considered to be the most environmentally prudent option. In order to remove this infrastructure, a significant volume of reinforced concrete would have to be removed from the ground. This could result in significant environmental nuisance such as noise, dust and/or vibration, pollution of surface waters and/or groundwaters, soils, traffic, and negative impacts on sensitive habitats within the vicinity of the Site. In addition, removal of the access roads has the potential to create significant noise and dust issues, as well as pollution of surface waters and additional traffic. As the access roads are also currently used for agricultural activities around the wind farm infrastructure, a further consequence would be the installation of farm tracks around the site to mitigate for the loss of the access roads. Therefore, as part of the Decommissioning Plan for the Proposed Lifetime Extension (i.e. decommissioning in 2036), it is only proposed to remove above ground structure from the site, this being the turbines and met mast.

In implementing the 'Do-Nothing' alternative however, i.e. decommissioning the existing wind farm in 2026, the opportunity to continue utilising the existing renewable energy infrastructure would be lost. So too would the opportunity to continue contributing to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas (GHG) emissions. Taurbeg Wind Farm is capable of suppling approximately 19,524 households with electricity every year based on the calculated power output of the development (see Section 4.3.1.5 in Chapter 4 of this EIAR for calculations).

The opportunity to continue to provide maintenance-related employment, community benefit fund, local authority development contributions, rates and investment in the local area would also be lost.

It is noted that the total current wind farm site, i.e. the EIAR Site Boundary as shown on figures, is approximately 112 hectares (ha). The existing development footprint therefore accounts for approximately 3.76ha or approximately 3% of the total Site area. The remainder of the Site is used for

commercial forestry and agricultural activities. These existing uses can and will continue in conjunction with the Proposed Lifetime Extension.

Should the Proposed Lifetime Extension not occur, the Proposed Offsetting Measures would also not take place. Existing land uses would exist at the Proposed Offsetting lands, comprising of coniferous plantation forestry and agricultural practises. The permanent restoration c.17.7ha of farmland for the benefit of hen harrier and deforestation of c.105.5ha of commercial forestry would no longer take place.

A comparison of the potential environmental effects of the 'Do-Nothing' Alternative when compared against the chosen option of extending the lifetime of the existing wind farm at the Site are presented in Table 3-1 below. On the basis of the positive environmental effects arising from the Proposed Lifetime Extension, when compared to the 'do-nothing' scenario, the 'do-nothing' scenario was not the chosen option.

Table 3-1 Comparison of environmental effects of 'Do-Nothing' alternative when compared against the chosen option (maintaining the existing wind farm at this site)

Environmental Consideration	'Do-Nothing' Alternative i.e. decommissioning of the existing wind farm in 2026
Population and Human Health (including Shadow Flicker)	Short term increase in local employment due to decommissioning works, followed by long-term loss of maintenance related employment, and loss of long-term financial contributions towards the local community via the Community Benefit Fund. Potential short-term negative effects on health and safety of construction workers due to the demolition work which is to occur during the decommissioning phase. Short term effects on residential amenity due to increases in traffic, noise and dust associated with the demolition works as part of the decommissioning plan.
Biodiversity and Ornithology	Decommissioning of the turbines will remove the collision risk for bat and birds. This is considered to have a potentially long-term positive effect on these receptors.
Land, Soils and Geology	Decommissioning of the wind farm will involve demolition and groundworks, which could result in short-term, slight negative environmental effects on land, soils and geology in the immediate vicinity of the decommissioning works. No potential for impact on subsoils and peat at the Proposed Offsetting lands due to erosion during no deforestation taking place. No potential for impact on peat stability due to deforestation.
Geotechnical	Decommissioning of the wind farm involves the removal of turbines and met mast, which could result in short-term, slight negative environmental effects of the geotechnical stability of the site within the immediate vicinity of the existing wind farm infrastructure. No potential for impact on subsoils and peat at the Proposed Offsetting lands due to erosion during deforestation. No potential for impact on subsoils at the Proposed Offsetting lands due to potential contamination of soil during leakages and spills. No

	potential for impact on peat stability at the Proposed Offsetting Lands due to deforestation.
Water	Decommissioning of the wind farm will involve demolition and groundworks, which could result in short-term, slight negative impacts upon local surface water and groundwater due to the proximity of the site to these sensitive receptors. No potential for impact on downstream hydromorphology, downstream surface water quality or designated sites due to deforestation.
Air and Climate	Decommissioning of the wind farm will involve short-term, imperceptible negative impacts on air quality from exhaust emissions and dust production. The decommissioning of the wind farm will prevent the extension of the opportunity for an improvement in air quality or reduction of greenhouse gases. The decommissioning will also not assist in achieving the renewable energy targets set out in the Climate Action Plan 2025[5]. Deforestation proposed as part of the Proposed Offsetting Measures does not take place. No change on air quality, due to no carbon emissions associated with deforestation works.
Noise and Vibration	Potential short-term, slight negative noise impacts on nearby sensitive receptors, associated with the decommissioning phase. No potential for further noise effects once the existing turbines are decommissioned. No potential for noise impacts associated with deforestation.
Landscape and Visual	There will be no further landscape and visual and visual effects related to turbines, once removed. There will be no impact on landscape and visual effects.
Cultural Heritage and Archaeology	There will be no effects on known, recorded archaeological sites and/or monuments due the decommissioning works. There will be no impact on archaeological sites/ monuments.
Material Assets	Decommissioning of the wind farm will involve short-term, slight negative impacts on local road users. No potential for material assets impacts associated.

[5] *Department of Environment, Climate and Communications (2025). Climate Action Plan 2025.*

3.3 Alternative Locations

3.3.1 Site Selection Process

It is considered appropriate to extend the operational phase of the existing wind farm at the Site for the following reasons:

- Taurbeg Wind Farm has been operating successfully at its current location since 2006 when it was first commissioned. The Site has proven to have reliably good wind speeds, maintained good generating capacity and delivered significant levels of renewable energy into the Irish national grid.
- While the turbine technology on the Site is dated, it is known that the existing 11 no. Bonus (now Siemens) SWT 2.3MW model turbines can continue to operate effectively for a further 10 years without a significant loss in total generating capacity of 25.3 megawatts (MW). As outlined in Chapter 1 of this EIAR, all 11 no. turbines which make up the existing Taurbeg Wind Farm are set to be decommissioned in of 2026, under the current permission. At this point, the turbines will have only been in operation for approx. 19 years, which is several years below their operational expectancy of approximately 30 years. The Applicant carried out technical feasibility assessments in consultation with Siemens to determine the qualitative remaining useful life of the Taurbeg Wind Farm turbines, which allow for the Applicant to safely extend the lifetime of the turbine components from a mechanical and operational safety perspective.
- The existing wind farm infrastructure on the Site, including the substation and site roads, can continue to be used for the extended operational period, which reduces environmental effects when compared to an undeveloped greenfield site, particularly in relation to landscape and visual effects and effects on locally important habitats.
- The wind farm site entrance can continue to be used without any alterations or upgrades needed.
- Taurbeg Wind Farm can comply with policies and principles outlined in Chapter 1: Introduction (of this EIAR) in terms of need for additional renewable energy in Ireland.
- Taurbeg Wind Farm can continue to contribute to the achievement of national energy targets and can continue to provide significant social and economic benefits for the local area (direct and indirect employment, community development fund) and the wider region.
- Repowering of the existing wind farm site (replacement of old turbines with new turbines to increase generating capacity) would likely require the use of a smaller number of significantly larger turbines. Repowering of the site with considerably larger turbines was not deemed feasible due to existing site constraints, in particular the proximity of existing residential dwellings to the site, and therefore increased potential effects from noise, shadow flicker and landscape and visual impacts.
- Having been previously permitted under the provisions of Pl. Ref. N/2002/3608, the principle for wind energy development and associated infrastructure on this site is already well established and has been proven to be in accordance with the proper planning and sustainable development of the area. Chapter 2 of this EIAR outlines the strategic planning context and provides further details of the Proposed Lifetime Extension's alignment with national, regional, and local policies, frameworks, guidelines and plans.

3.3.2 Review of Alternative Sites

As part of the Applicant's review of site alternatives, consideration was made to using a new greenfield site and construction of a new wind farm. In order to compare the potential for environmental effects, a

notional greenfield site of 112 ha site is was considered and development at this site would involve construction of 11 no. turbines with an output of 25.3 MW, the same as in the existing Taurbeg Wind Farm.

The construction of a new wind farm at an alternative greenfield site could have potentially greater environmental effects on hydrology and hydrogeology, traffic & transport, landscape and biodiversity (habitat loss) compared to the Proposed Lifetime Extension. Furthermore, there would be significant capital investment required in developing a new site, as opposed to extending the lifetime of an existing wind farm.

A comparison of the potential environmental effects of developing an alternative site for a new wind energy development when compared against the chosen option of extending the lifetime of the existing Taurbeg Wind Farm are presented in Table 3-2 below. On the basis of the positive environmental effects arising from the Proposed Lifetime Extension, when compared to constructing a new wind farm at an alternative site, this scenario was not the chosen option.

Table 3-2 Comparison of environmental effects of alternative site when compared against the chosen option (maintaining the existing wind farm at this site)

Environmental Consideration	Alternative wind farm at alternative site (with a 25.3MW output)
Population & Human Health (incl. Shadow Flicker)	Potential for shadow flicker and noise to affect sensitive receptors.
Biodiversity & Ornithology	Potential for collision risk for bats and birds Greater habitat loss associated with construction phase
Land, Soils and Geology	Greater levels of disturbance to soils and geology in order to develop new site infrastructure for new wind farm.
Geotechnical	Excavations involved in constructing new wind farm. More site disturbance due to construction works.
Water	Potential for silt-laden runoff to enter receiving watercourses associated with construction of a new wind farm.
Air Quality and Climate	The construction phase will result in dust emissions and temporary reduction in air quality. Also, the new wind farm will have to operate for a period of time before the embodied carbon generated during its manufacture and construction has been paid back.
Noise and Vibration	Potential for noise impacts on nearby sensitive receptors during the operational phase. Increased potential for noise impacts on nearby sensitive receptors during the construction phase of a new wind farm.
Landscape and Visual	Potential for landscape and visual impacts associated with a wind farm development. Alters landscape character.

Cultural Heritage & Archaeology	Potential for negative effects on cultural heritage sites due to construction of a new wind farm.
Material Assets	Potential for traffic volumes during construction phase and requirement for more construction materials.

Furthermore, the Applicant has undertaken a review of their operational wind farm portfolio on sites approaching expiry of permission, with a view to determine if they should be decommissioned, the operational life extended or if they were suitable for repowering. It was then decided which of the sites should be first selected for extension of operation.

Taurbeg Wind Farm was considered suitable for extension of operation due to the success of the existing site, the good condition and performance of the existing turbines and site infrastructure, the wind regime on the Site and the existing grid connection infrastructure. The turbines at Taurbeg Wind Farm have been operational since 2006 and are still in good operational condition.

The landowners of the existing wind farm and substation development have a long-term lease agreement with the Applicant for utilisation of the lands. This application is for an extension of life of the operational Taurbeg Wind Farm and therefore, further detailed assessment of alternative locations was not considered to be applicable in this instance.

3.4 Alternative Processes

The activities that affect the volumes and characteristics of emissions, residues, traffic and the use of natural resources has formed part of the consideration of alternatives through the Proposed Lifetime Extension.

No construction activities, groundworks or alterations to the existing wind farm infrastructure is proposed as part of the Proposed Lifetime Extension. There are no processes which have the potential to be carried out alternatively. Due to the absence of a construction stage, alternative processes designed to reduce emissions and use of resources during the construction stage are not required. During the operational phase, the processes required at the Site are relatively benign. There are no manufacturing processes per se with the potential for the generation of significant emissions to any environmental media, the use of finite natural resources or the generation of wastes or traffic volumes. On this basis, alternative processes designed to reduce emissions and use of resources during the operational stage are not required.

The low level of operation and maintenance (O&M) activities required at the Site will require the use of relatively minimal quantities of raw materials in the form of energy to supply plant and machinery, standard building materials including stone, metals pipework, concrete, electrical and oils, greases and other components and consumables. Raw materials are also utilised in the manufacture of wind turbine components and electrical infrastructure that may require replacement. The use of these resources will be controlled by the employment of best practice O&M techniques including waste management practices.

During the proposed decommissioning phase, the processes required on Site have evolved from what was conditioned under the original wind farm planning permission (Pl. Ref. N/2002/3608). The decommissioning processes are seen as the most environmentally sensitive, and activities which are required on Site which have the potential to generate emissions or significant traffic volumes or involve the use of finite resources have been chosen in line with best practice decommissioning methods.

The purpose of the Proposed Lifetime Extension is to generate electricity from an infinite renewable source which will offset the use of finite fossil fuels. The baseline scenario without implementation of the Proposed Lifetime Extension is not to provide a renewable energy source at this suitable location, therefore failing to contribute to climate change and energy policy objectives. Such an approach would neither be optimal nor appropriate.

3.5 Alternative Technologies

The current Site is developed as a wind farm capable of generating up to 25.3 MW of renewable energy. The Proposed Lifetime Extension will maintain this level of renewable energy generation with little additional capital investment required and no significant increases in operating costs.

The existing Site could potentially be redeveloped with an alternative renewable energy technology with solar photovoltaic (PV) array, or a solar/ wind energy mix deemed suitable to this location.

Redevelopment of this Site as a large-scale solar farm capable of generating enough energy to be economically viable would drastically change the existing character of the land, as it would have a significantly larger footprint. According to the Sustainable Energy Authority of Ireland (SEAI), approximately 1.6 – 2.0 hectares (ha) of solar array area is required for each Megawatt generated. Therefore, in order for a solar farm to deliver at least 25.3 MW (the current wind farm generating capacity) a footprint area of approximately 40.5 –50.6ha of solar array would be required. In comparison, the current wind farm (turbines, substation, roads, and hardstanding areas) footprint is 3.76 ha.

Additionally, the construction of a solar development could have a potential environmental effect on Hydrology & Hydrogeology, Traffic & Transport (construction phase) and Biodiversity (habitat loss) at the site compared to extending the lifetime of the existing wind farm, due to the additional requirement for land.

In consideration of the existing site constraints, significant capital investment required in order to redevelop the current wind farm site as a solar farm, increased development footprint, and the ability of the existing wind turbines to perform for a further 10 years, it was not deemed suitable to further pursue this alternative land use option. Further assessment is provided in Table 3-3 below.

Table 3-3 Comparisons of environmental effects of Alternative Land Use of Solar Energy when compared against the chosen option (maintaining use of wind turbines)

Environmental Consideration	Solar PV Array (with a 25.3MW output)
Population & Human Health (incl. Shadow Flicker)	No potential for shadow flicker to affect sensitive receptors. Potential for glint and glare impacts to local residents and road users.
Biodiversity & Ornithology	No potential for collision risk for bats and birds Larger development footprint would result in greater habitat loss.
Land, Soils and Geology	Conversion of Site to a solar farm would result in greater levels of disturbance to soils and geology in order to develop new site infrastructure suitable for a solar farm.
Geotechnical	Excavations and piling involved in Solar PV array developments. More site disturbance due to construction works.

Water	Construction of a larger development footprint required, therefore increasing the potential for silt-laden runoff to enter receiving watercourses. Large-scale solar PV array has the potential to alter drainage patterns in the immediate vicinity.
Air Quality and Climate	The construction phase will result in dust emissions and temporary reduction in air quality. Also, the solar farm will have to operate for a period of time before the embodied carbon generated during its manufacture and construction has been paid back. Over a 10-year period a 25.3MW solar farm will not produce the same amount of electricity as a 25.3MW windfarm, due to a lower capacity factor, and therefore will not offset the same level of carbon emissions during that period.
Noise and Vibration	Lower potential for noise impacts on nearby sensitive receptors during the operational phase. Increased potential for noise impacts on nearby sensitive receptors during the construction phase of a new solar farm.
Landscape and Visual	Potentially less visible from surrounding area due to screening from vegetation and topography. Alters landscape character.
Cultural Heritage & Archaeology	Potential for negative effects on cultural heritage sites due to construction of larger development footprint of solar.
Material Assets	Potential for greater traffic volumes during construction phase due to larger development footprint and requirement for more construction materials.

3.6 Alternative Turbine Layouts and Development Design – Repowering Option

Each of the 11 no. existing wind turbines at Taurbeg Wind Farm have a potential power output of 2.3MW to deliver a total generating capacity of up to 25.3MW. It is proposed to extend the operational lifespan of the 11 no. existing turbines of 108.2m blade tip-height at the site. A similar generating capacity could also be achieved on the existing site by using a significantly larger turbine technology (for example, 6.3MW machines). This would necessitate the installation of at least 4 no. new turbines of approximately 185m total height to achieve a similar output. Taking into account the spacing required between turbines of this scale, it is unlikely that there is a sufficient viable area within the lands that are currently under the control of the applicant to accommodate 4 no. turbines with a tip height of 185m.

The use of significantly larger turbines at the Site, while likely to reduce the development footprint has the potential to be problematic in terms of potential negative noise impacts, shadow flicker, ornithology/biodiversity impacts, and landscape and visual impacts to the surrounding residential receptors. The construction of larger turbines at the Site at this time would necessitate significant road upgrades and potential realignments, in order to accommodate delivery of larger turbine components, increasing the potential for negative environmental effects on biodiversity, hydrology and traffic and transportation

It should be noted that no alterations to the pre-existing turbine model installed on the Site is proposed for this lifetime extension application. The maximum height of the turbines is 108.2m when measured from ground level to blade tip. For the purposes of this EIAR this is the turbine size which has been assessed (e.g., existing turbine dimensions used for visual impact, shadow flicker etc.). The EIAR therefore provides a robust and accurate assessment of the turbines considered within the overall development description.

A comparison of the potential environmental effects of the installation of a smaller number of larger wind turbines when compared against the chosen option of maintaining a larger number of smaller wind turbines are presented in Table 3-4 below.

Table 3-4 Comparison of environmental effects when compared against the chosen option (smaller wind turbines)

Environmental Consideration	Smaller Number of Larger Turbine Models
Population and Human Health (incl. Shadow Flicker)	Greater potential for shadow flicker impacts on nearby sensitive receptors due to the increased height and overall size of turbines and increased Shadow Flicker Study Area.
Biodiversity and Ornithology	Likely impacts from construction (excavations, rock-breaking, increased traffic volumes) required to install larger turbines on the Site present an increased potential to negatively impact biodiversity due to disturbance and displacement effects. The development footprint would likely be similar in size due to the requirement to space larger turbines further apart from one another and increased foundation size and hardstanding areas. Habitat loss of fewer number of larger turbines is likely to be neutral. There is a greater potential collision risk for birds due to the presence of turbines up to 70% higher than those currently existing, encompassing a larger blade length and swept area.
Land, Soils and Geology	Larger development footprint would result in greater volumes of soil/rock/spoil to be excavated and managed.
Water	Larger development footprint, therefore, increasing the potential for silt laden runoff to enter receiving watercourses.
Air and Climate	Increased potential for vehicle emissions and dust emissions due to an increased volume of construction material and turbine component deliveries to the site.
Noise and Vibration	Potential for increased noise impacts on nearby sensitive receptors due to reduced separation distance between residential dwellings and turbine locations.
Landscape and Visual	Although a smaller number of turbines would be present, the significantly greater turbine height would have a potentially greater landscape and visual impact.
Cultural Heritage and Archaeology	Larger development footprint relating to road widths, hardstanding and foundation areas likely to increase the potential for impacts on upon any unrecorded, subsurface archaeology.

Material Assets	Greater traffic volumes during construction phase due to requirement for more construction materials and turbine components.

3.6.1 Location of Ancillary Structures

The ancillary infrastructure required for the operation of the Proposed Lifetime Extension includes a substation, site roads, hardstanding areas and underground cabling. No alterations are proposed to the locations of the existing site structures, as detailed in Chapter 4: Description of the Proposed Project and Figure 4-1.

These structures were initially situated based upon the constraints of the Site, and these constraints have not changed significantly in the intervening period.

The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. The grid connection has been assessed cumulatively with the rest of the wind farm infrastructure, as part of the EIAR.

3.7 Alternative Offsetting Measures

As detailed in Chapter 4, Chapter 7 and Appendix 7-7, offsetting measures have been put forward which aim to reduce the potential effects of the Taurbeg Wind Farm on hen harrier. The Proposed Offsetting Lands are located approximately 8km east of Castleisland, Co. Kerry in the townlands of Coom and Knockatee and c. 12km east of the Taurbeg Wind Farm Site in Co. Kerry. The Proposed Offsetting Measures comprise the permanent removal of c. 105.5 ha of coniferous plantation forestry and the restoration of c.17.7 ha of farmland for the benefit of hen harrier.

The Proposed Offsetting Measures have been specifically designed to target the two key threats/pressures of high importance on hen harrier, these being forestry and agricultural intensification to offset the potential for impacts associated with the Proposed Lifetime Extension of the wind farm. The Proposed Offsetting Measures aim to provide an increase in the availability of passerine prey within the Proposed Offsetting lands to offset for the loss of the foraging habitat due to the ongoing operation of the existing Taurbeg Wind Farm.

As part of the selection process for the Proposed Offsetting Lands, large forestry plots were identified, occurring on peatland that could be converted to more suitable upland habitats for foraging hen harrier by deforestation. Farmland was also identified that could offer opportunities to significantly improve their ecological value to foraging hen harrier. Rationale for selecting the chosen Proposed Offsetting lands was based on the largest parcels of land identified that would be suited for hen harrier habitat creation which was available to the Applicant within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. Further detail on selection process of these lands is provided in Chapter 7 Ornithology and Appendix 7-7.

The land chosen as the Proposed Offsetting lands fulfils the requirement to maintain the overall coherence of the Natura 2000 network. The two key elements that have been addressed are the proportionality and ecological functionality of the Proposed Offsetting lands.

The alternative to the Proposed Offsetting Measures is to either not propose these measures or proposed measures/ lands which are not suitable and not in line with best practise. Neither of these options are preferable when compared to the chosen option.

3.8 Alternative Mitigation Measures

The best practice mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the site and any identified environmental receptors.

Due to the nature of the Proposed Lifetime Extension (existing wind farm with no construction works, groundworks or land use change proposed), the greatest potential for environmental effects exists during the extended operational phase. During the extended operational phase, there are no significant ongoing emissions to any environmental media (water, air, soil, etc) and the overall general environmental risk associated with the existing infrastructure is low. Further alternative mitigation measures for this phase are therefore not necessary for further consideration, in most instances.

The proposed Decommissioning Plan (Appendix 4-3) is seen as the most environmentally prudent option, as to remove the structures and return the site to its original condition would involve removal of site roads and turbine foundations, which would require significant excavation and ground works. The proposed decommissioning phase mitigation measures follow current technologies, methods and best practice, and thus further alternative mitigation measures are not considered necessary.

Planning and Environmental Consultants

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 4 – Description of the Proposed Project

DOCUMENT DETAILS

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Project Title:	**Taurbeg Wind Farm Extension of Operational Life**
Project Number:	**231030**
Document Title:	**Environmental Impact Assessment Report**
Document File Name:	**Ch. 4 Description of the Proposed Project F - 2025.06.30 - 231030**
Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

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4. DESCRIPTION OF THE PROPOSED PROJECT

4.1 Introduction

Planning permission is being sought for the extension of the operational life of Taurbeg Wind Farm (Proposed Lifetime Extension) as permitted by Cork County Council under planning regulation ref N/2002/3608, for a further period of 10 years from the date of expiry (2026) per Condition no. 7 of the original planning consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Lifetime Extension does not comprise any alterations to the existing operational wind farm. The Applicant intends to submit an application to Cork County Council for the Proposed Lifetime Extension.

The Proposed Lifetime Extension comprises:

i. *11 no. existing wind turbines with a tip height of 108.2 metres and all associated foundations and hardstanding areas;*
ii. *1 no. existing onsite 38kV electrical substation including a control building, associated electrical plant and equipment, welfare facilities and a wastewater holding tank;*
iii. *1 no. existing meteorological mast with a height of 67m;*
iv. *All existing underground electrical and communications cabling connecting the existing wind turbines to the existing onsite 38kV Substation;*
v. *An existing gated site entrance and existing internal access tracks;*
vi. *Existing site drainage;*
vii. *Existing ancillary infrastructure, associated site fencing and signage.*

The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. A 38kV underground cable runs between the onsite substation and a mast at the south of the site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The grid connection does not form part of the current planning application.

The Proposed Lifetime Extension is expected to have significant negative effects on displacement of Hen Harrier. Proposed Offsetting Measures have been developed to offset these effects. The lands within which these measures are proposed are located c. 12km east of the Taurbeg Wind Farm Site in Co. Kerry. The Applicant intends to submit an application to Kerry County Council for the Proposed Offsetting Measures.

The Proposed Offsetting Measures comprise:

i. *Permanent removal of commercial forestry (deforestation) over an area of approx. 105.5 Ha and the restoration of open peatland and creation of scrub habitat within the felled area.*
ii. *Restoration of farmland habitat to good quality hen harrier foraging habitat through diversifying the range and extent of habitats over an area of approx. 17.7 Ha;*
iii. *All associated site development works including fencing.*

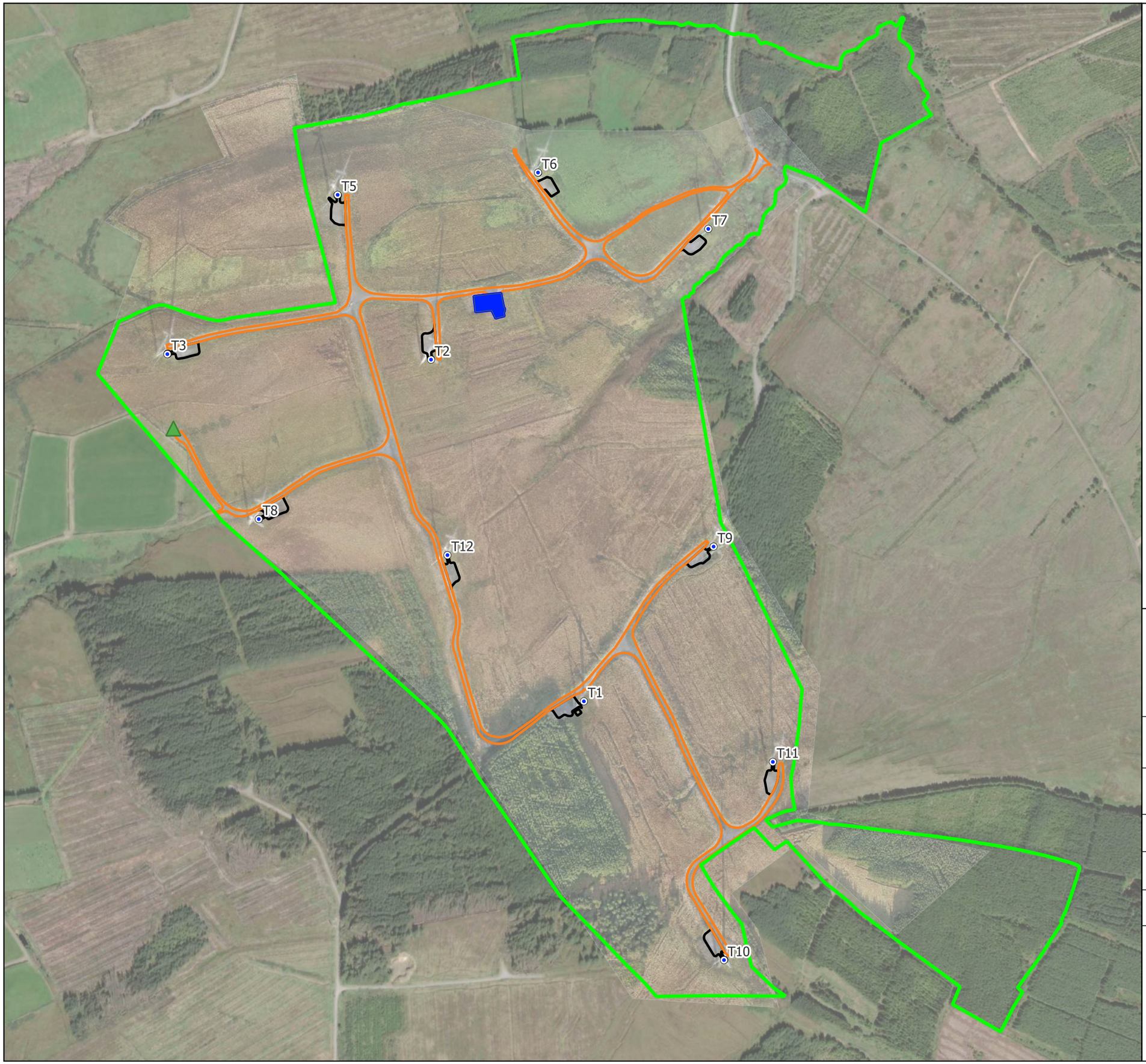
A full description of the Proposed Project for the purposes of the planning application and the additional elements that form part of the overall project, assessed in this EIAR, is outlined in Chapter 4 of this EIAR. Further details of the Proposed Offsetting Measures can also be found in Appendix 7-7 of the EIAR.

4.2 Development Layout

The layout of the existing Taurbeg Wind Farm was originally designed to minimise the potential environmental effects of the wind farm, while at the same time maximising the energy yield of the wind resource passing over the site.

The existing Taurbeg Wind Farm site was chosen initially as being particularly suited to a wind energy development due to the favourable wind conditions. The prevailing southwesterly winds sweep across the island of Ireland providing one of the best wind resources in Europe. The estimated long-term mean wind speed on the site is 6.6m/s.

The overall layout of the existing Taurbeg Wind Farm is shown on Figure 4-1. This drawing shows the locations of the existing wind farm infrastructure. Detailed site layout drawings of the existing development are included in Appendix 4-1 to this EIAR.



Map Legend

- Taurbeg EIAR Site Boundary
- Existing Turbines
- Existing Site Roads
- Turbine Foundation and Hardstand
- Existing Onsite Substation
- Existing Met Mast

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Drawing Title
Proposed Lifetime Extension Layout Map

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
MC	EMC
Project No.	Drawing No.
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Scale	Date
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4.3 Development Components

The Proposed Project components are listed under Section 4.1 above. Table 4-1 below provides a summary of the footprint of the Proposed Lifetime Extension components, which are subject to this planning application.

There are no changes proposed to the existing Taurbeg Wind Farm components as part of the Proposed Lifetime Extension. The various elements of the existing Taurbeg Wind Farm will remain in their current condition and will be subject to ongoing routine maintenance.

Table 4-1 Proposed Lifetime Extension components footprint

Component Description	Approx. Area (hectares)
11 no. Turbines and associated hardstandings, substation and met mast	0.54 ha
Internal site access roads (approximate 5.5m running width for site roads)	3.22 ha
Total	3.76 ha

Further details on each of the Proposed Lifetime Extension components are presented in Sections 4.3.1 to 4.3.4 below.

4.3.1 Wind Turbines

4.3.1.1 Turbine Locations

The existing Taurbeg Wind Farm layout was optimised using industry-standard wind farm design software at the initial design stage in order to maximise the energy yield from the site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects did not compromise turbine performance. The Grid Reference coordinates of the existing turbine locations are listed in Table 4-2 below. (Note: eleven of the fourteen turbines consented under Pl. Reg. Ref: N/2002/3608 were constructed, with the planning permission of the remaining three turbines now expired. Therefore, there are eleven operational turbines at the existing Taurbeg Wind Farm, and there is no turbine T4 onsite.)

Table 4-2 Existing Taurbeg Wind Turbine Locations and Elevations

Turbine No.	Irish Transverse Mercator (ITM) Co-ordinates		Turbine Base Elevation (m OD)
	Easting (m)	Northing (m)	
1	522662	611398	387
2	522413	611954	370
3	521984	611963	370
5	522261	612222	392
6	522587	612258	360

Turbine No.	Irish Transverse Mercator (ITM) Co-ordinates		Turbine Base Elevation (m OD)
	Easting (m)	Northing (m)	
7	522864	612167	330
8	522133	611695	361
9	522873	611650	373
10	522890	610978	397
11	522969	611300	401
12	522440	611636	372

4.3.1.2 Turbine Type

Wind turbines use the energy from the wind to generate electricity. A wind turbine, as shown in Plate 4-1 below, typically consists of four main components:

- Foundation
- Tower
- Nacelle (turbine housing)
- Rotor

Plate 4-1 Typical wind turbine components

The existing wind turbines have a tip-height of 108.2m, a hub height of 67m, a rotor diameter of 82.4m, and a ground to lowest blade swept path of 25.8m. The wind turbines that are installed on the site are conventional three-blade turbines, that are geared to ensure the rotors of all turbines rotate in the same direction at all times.

The existing wind turbines at the Taurbeg Wind Farm are Bonus (now Siemens) SWT 2.3 82 turbines 2.3 MW model installed at Taurbeg Wind Farm (See Plate 4-2 as a reference to an existing turbine at the site). Each turbine is capable of producing 2.3MW of electricity.

Plate 4-2 Existing Taurbeg Wind Farm turbines

Turbine design parameters have a bearing on the assessment of shadow flicker, noise, visual impact and ecology (specifically birds), as addressed elsewhere in this EIAR. Since there are no changes proposed to the existing turbines at the Site, the parameters of the existing turbines have been used in each EIAR section that requires consideration as part of the impact assessment.

A drawing of the existing wind turbine model is shown in Figure 4-3. The individual components of a typical geared wind turbine nacelle and hub are shown in Figure 4-2 below.

Figure 4-4 shows a typical turbine base layout, including turbine foundation, hard standing area, assembly area, access road and surrounding works area.

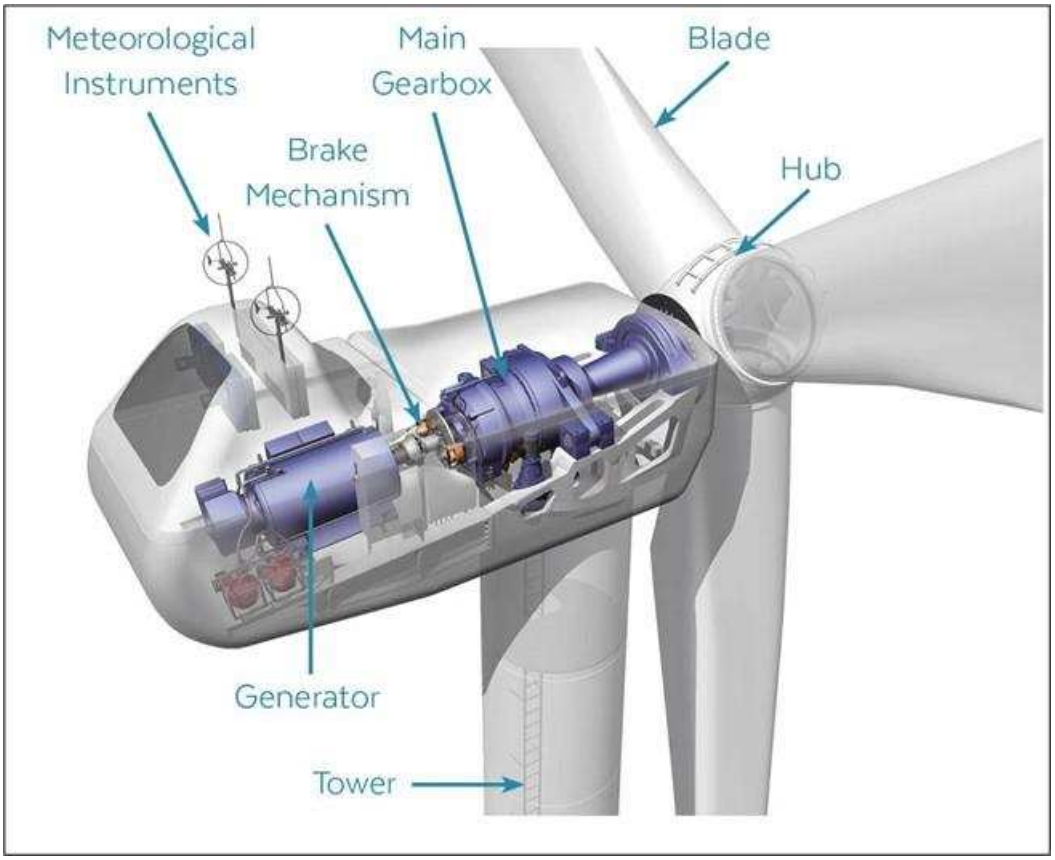
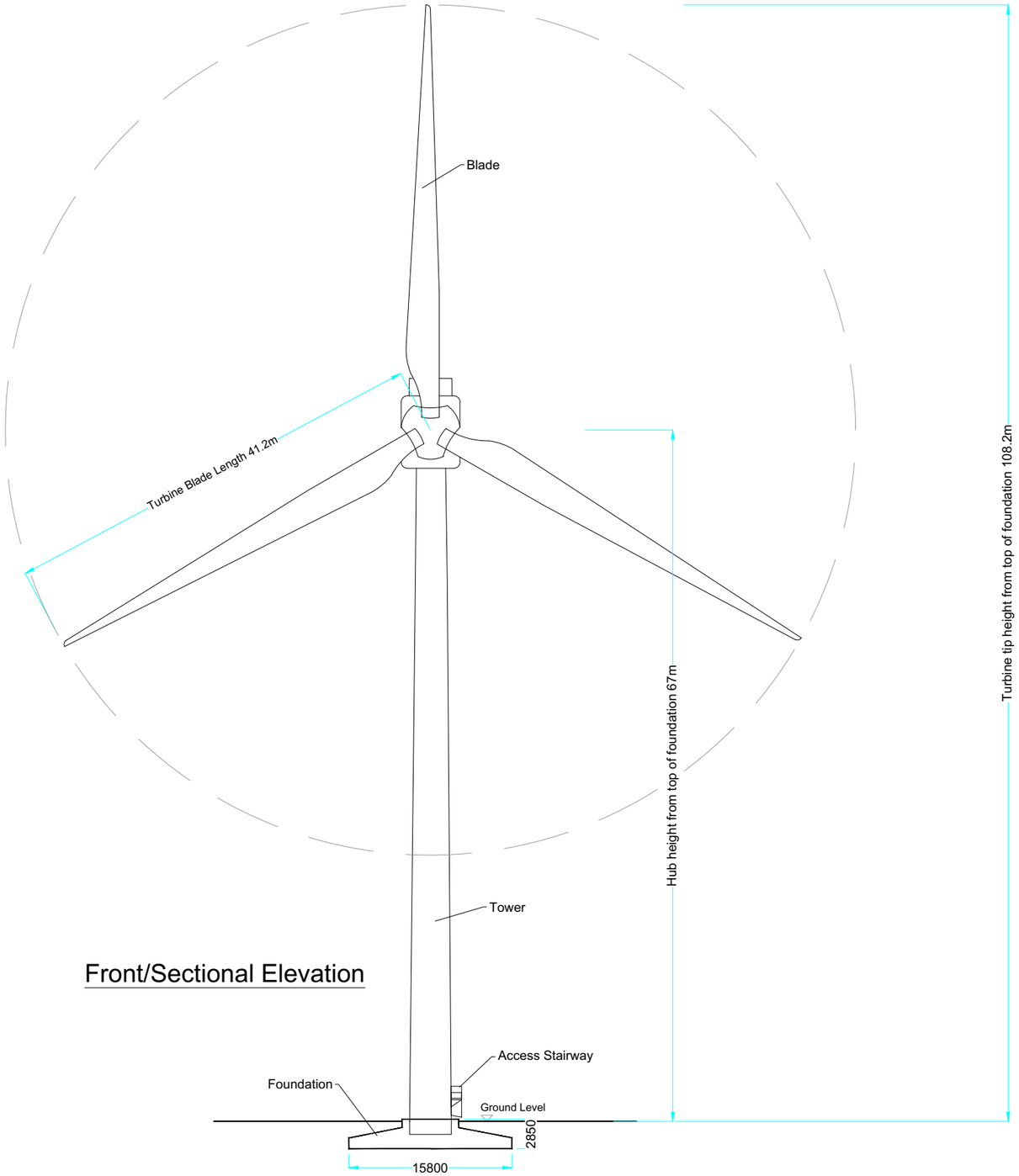
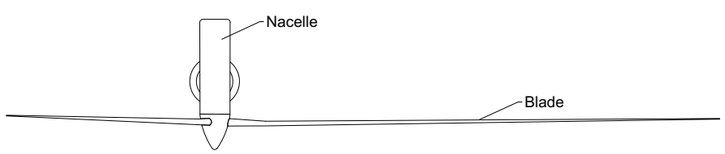


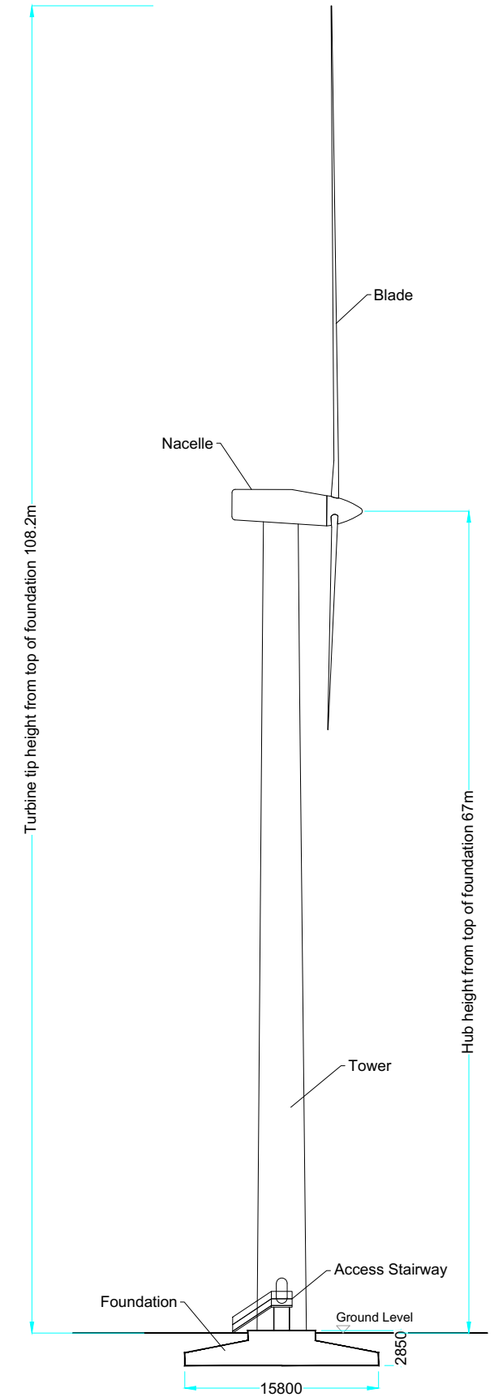
Figure 4-2 Turbine nacelle and hub components



Front/Sectional Elevation



Plan



Side/Section Elevation

Figure 4-3

PROJECT TITLE: **Taurbeg Wind Farm Extension of Operational Life**			
DRAWING TITLE: **As Built Turbine Elevations & Plan**			
PROJECT No.: **231030**		DRAWING No.: **231030 - 05**	SCALE: **1:500 @ A3**
DRAWN BY: **GO**	CHECKED BY: **RD**	DATE: **04.07.2025**	REVISION.: P01

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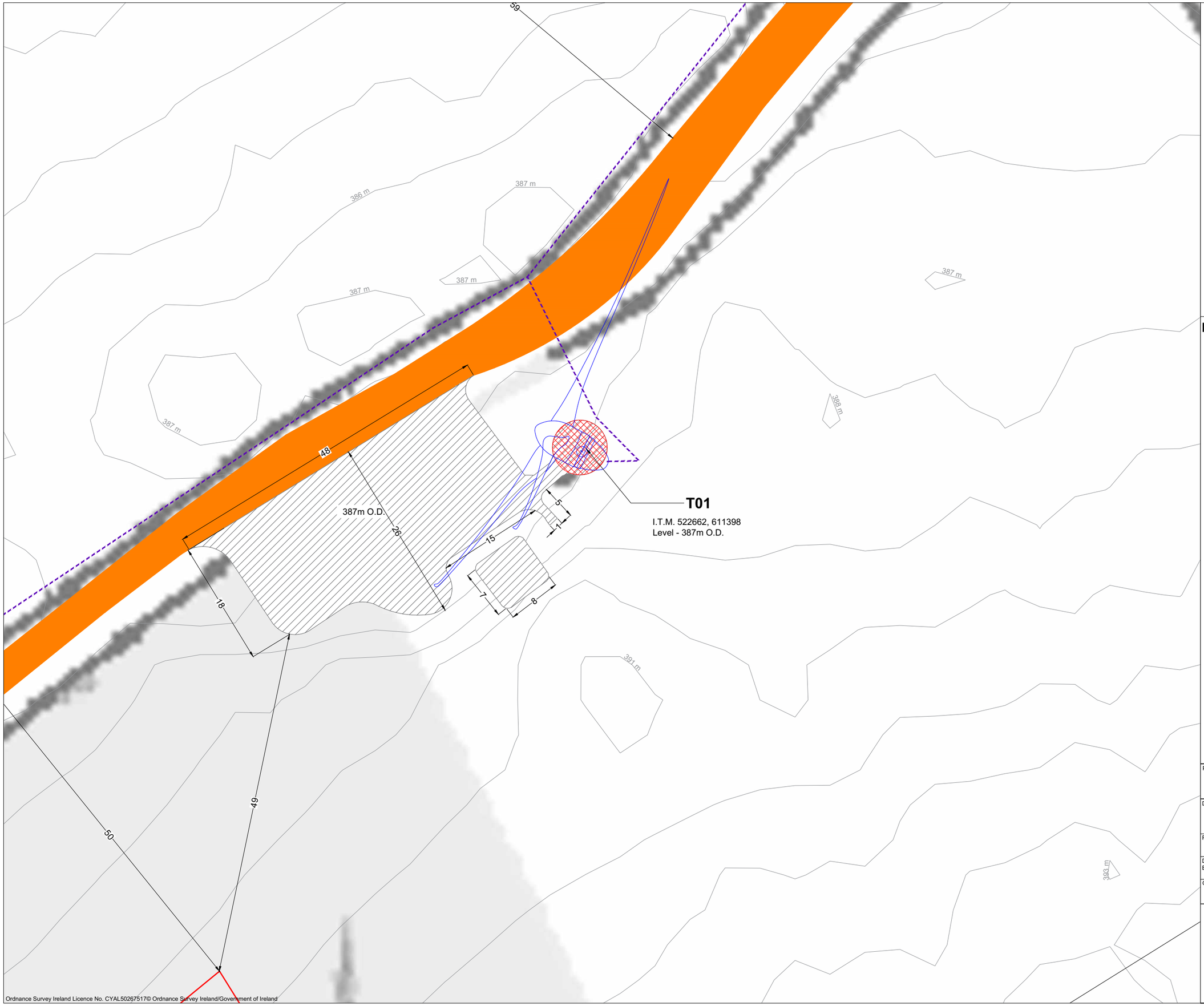

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Drawing Legend

- Planning Application Boundary (Cork County Council)
- As Built Site Road
- As Built Hardstanding Area
- As Built Turbine
- As Built Turbine Foundation
- Electrical Cable Trench

Figure 4-4

N

PROJECT TITLE:
Taurbeg Wind Farm Extension of Operational Life

DRAWING TITLE:
Turbine Layout Sheet 01 of 11

PROJECT No.:	DRAWING No.:	SCALE:
231030	231030 - 04A	1:500 @ A3

DRAWN BY:	CHECKED BY:	DATE:	REVISION.:
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4.3.1.3 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that has been installed below the finished ground level. The turbine foundation transmits any load on the wind turbine into the ground.

The existing turbine foundations are circular in plan with an average area of 100m^2. The existing turbine foundations as designed for the Taurbeg Wind Farm are shown in Figure 4-5 and Figure 4-6. There are no changes proposed to the existing turbine foundations as part of the Proposed Lifetime Extension.

Figure 4-5 Typical Turbine Foundation Design - Levelled Turbine Tower 'Can'

Figure 4-6 Steel Reinforcement being added

4.3.1.4 Hard Standing Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base when constructing a wind farm, to facilitate access, turbine assembly and turbine erection. The hard-standing areas provide a safe, level working area around each turbine position. The hard-standing area is also intended to accommodate a crane during turbine decommissioning and disassembly, and if necessary, during maintenance works.

There will be no changes to the existing hardstanding areas as part of the Proposed Lifetime Extension. The existing hardstand areas vary slightly at each of the 11 no. turbines, with an average area of approximately 722m^2. Plate 4-3 below depicts a typical hardstand at the site. The existing hard standing areas shown on the detailed layout drawings included in Appendix 4-1 to this report will be maintained.

Plate 4-3 Existing hardstand within the Site

4.3.1.5 Power Output

The existing wind turbines have a rated electrical power output in the range of 2.3 Megawatt (MW) per turbine, resulting in an estimated installed capacity of 25.3 MW. The existing wind farm therefore has an average annual power output of 82,002 Megawatt-hours per year (MWh/yr), based on the following calculation:

A x B x C = Megawatt Hours of electricity produced per year

where:

A = The number of hours in a year: 8,760 hours

B = The capacity factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc. A standard capacity factor of 37% is applied here.[1]

C = Rated output of the wind farm: 25.3 MW

This power output would continue for the extended 10-year operation of the existing Taurbeg Wind Farm, subject to planning permission.

The 82,002 MWh/yr of electricity produced by the existing Taurbeg Wind Farm is sufficient to supply approximately 19,524 Irish households with electricity per year, based on the average Irish household using 4.2 MWh[2] of electricity. For context, the 2022 Census of Ireland recorded a total of 128,411 occupied households in Co. Cork. Per annum, based on the current average power output of 82,002 MWh/yr, the existing Taurbeg Wind Farm therefore produces sufficient electricity for the equivalent of approximately 15% of all occupied households in Co. Cork.

[1] *Eirgrid, 2022 Enduring Connection Policy 2.3 Constraints Report for Solar and Wind <https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Results-for-Area-E-v1.1.pdf> The Proposed Lifetime Extension is located within the E wind region for Ireland with an associated capacity factor of 37%.*
[2] March 2017 CER (CRU) Review of Typical Consumption Figures Decision *https://www.cru.ie/document_group/review-of-typical-consumption-figures-decision-paper/*

4.3.2 Site Roads

During the initial construction of the existing Taurbeg Wind Farm, existing tracks were upgraded and new access roads were constructed to provide access within the wind farm site and to connect wind turbines and associated infrastructure. Site roads were constructed of consolidated gravel with an average running width of 5.5m and total length of 8.4km. A typical section through an excavated site road is shown in Figure 4-7.

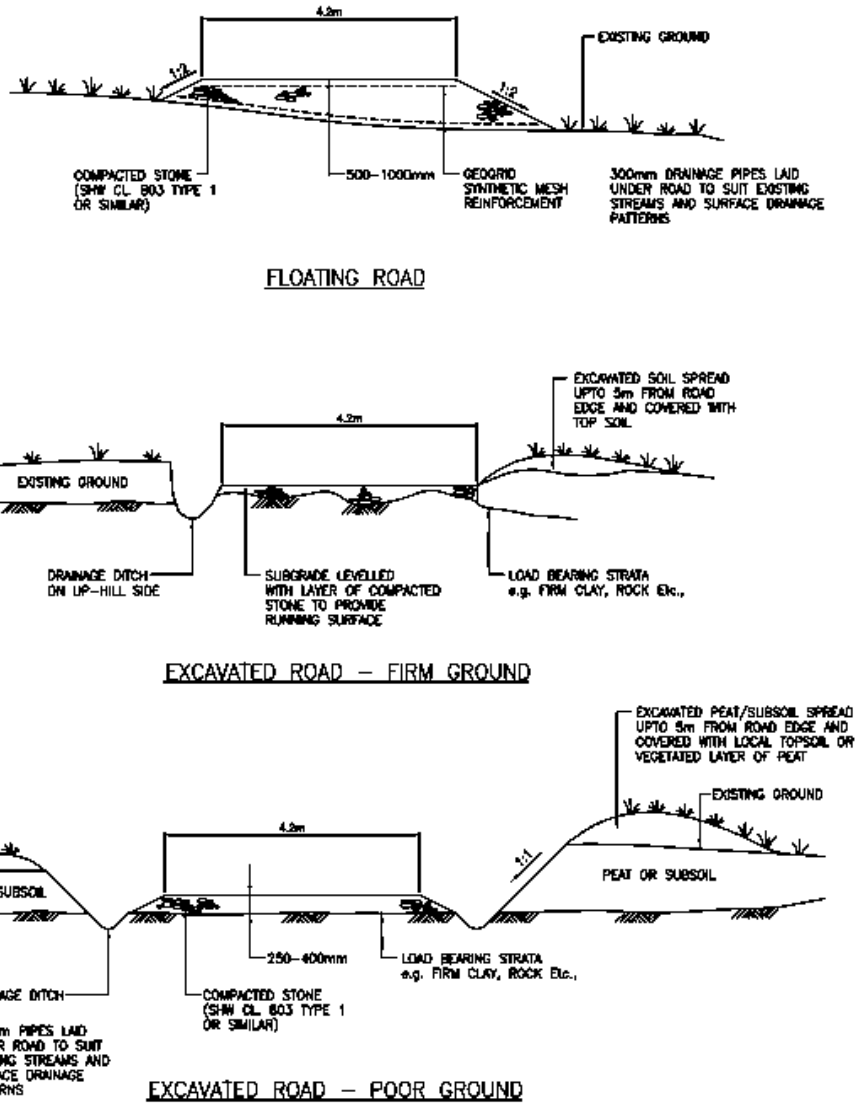


Figure 4-7 Typical Site Access Road Detail

A photograph of a typical existing site road in included as Plate 4-2. There will be no changes to the existing site roads required as part of the Proposed Lifetime Extension.

4.3.2.1 Site Access

The existing Taurbeg Wind Farm is accessed via the wind farm site entrance off the unnamed local road, in the townland of Taurbeg and is served by a network of existing wind farm access roads.

4.3.3 Site Cabling

Each turbine is connected to the on-site electricity substation through underground medium voltage (MV) electricity and communications cabling. Multicore fibre-optic cabling connects each wind turbine to the wind farm control building. The electricity and fibre-optic cabling run in trenches below the ground surface, along the sides of or underneath the internal roadways. The routes of the cabling ducts follow the access tracks to each turbine location.

4.3.4 Wind Farm Site Drainage

There are no groundworks involved in the Proposed Lifetime Extension, and therefore no existing natural drainage features will be altered and there will be no direct or indirect discharges to natural watercourses.

During decommissioning of the existing Taurbeg wind farm, it is intended to limit groundworks other than to rehabilitate constructed areas such as turbine bases and hardstanding areas. This will be done by covering with topsoil to encourage vegetation growth and reduce run-off and sedimentation. Electrical cabling connecting the site infrastructure to the on-site substation will be removed, while the ducting itself will remain in-situ instead of excavating and removing it. The turbines will be removed and transported off-site along their original delivery route, and the turbine concrete bases will remain in the ground and backfilled. With the implementation of the decommissioning phase drainage measures as outlined in Chapter 9: Hydrology and Hydrogeology, the residual effects will be negative, imperceptible, indirect, short-term, temporary, likely effects on downstream water quality.

Further details on the site hydrology are provided in Chapter 9: Hydrology and Hydrogeology of this EIAR.

4.4 Substation and Grid Connection

The Taurbeg Wind Farm is connected to the existing Glenlara 110kV Substation. A 38kV underground cable runs between the onsite substation and a mast at the south of the site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The overhead line does not form part of the current planning application and was subject to a separate planning application (Pl. Reg. Ref: N/2001/6549) but has been assessed cumulatively with the rest of the wind farm infrastructure, as part of the EIAR.

The existing substation compound measures approximately 1,428m^2. There are no changes to the existing substation, control building or grid connection proposed as part of the Proposed Lifetime Extension.

4.5 Proposed Offsetting Lands

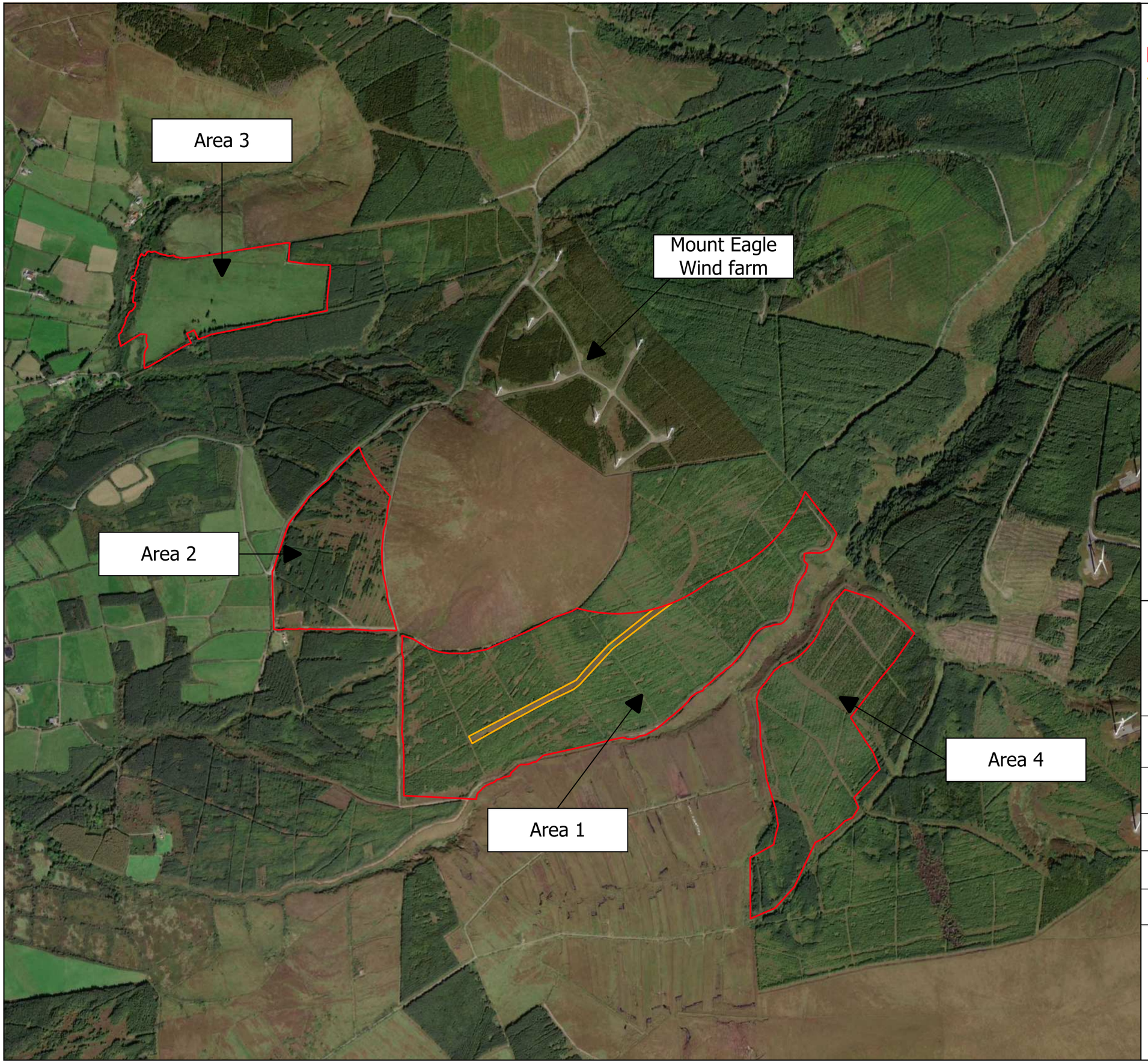
The Proposed Project includes management of lands required for the offsetting of potential effects of the continued operation of the existing Taurbeg Wind Farm on hen harrier. The Proposed Offsetting lands are located in Knockatee and Coom, Co. Kerry, approximately 11.5km east from the Taurbeg Wind Farm site. Offsetting measures include permanent removal of commercial forestry in Area 1, 2 and 4 and restoration of farmland to good quality hen harrier habitat in Area 3.

Landcover in Areas 1, 2 and 4 is mature coniferous forestry and Area 3 is agricultural pastural land. All areas are accessible via local roads and existing private access tracks. See Figure 4-8 below.

A habitat loss calculation was undertaken with reference to the suitability of the habitats surrounding existing turbine locations and the likely distance turbines will be avoided by hen harrier. In this habitat loss calculation, it was assumed that there would be total avoidance of a buffer zone within a 250m

radius of the existing wind turbines (in line with the result of Pearce-Higgins *et al.*, 2009). Based on this approach and having calculated the amount of foraging habitat available on an annual basis (taking into account standard forestry management practices for forested areas), the estimated quantum of habitat from which hen harrier will be displaced is **122.43 hectares**. Further detail on the habitat loss calculation is provided in Section 2 of Appendix 7-7.

The Proposed Offsetting Lands fulfil the requirement to maintain the overall coherence of the Natura 2000 network. The two key elements that have been addressed are the proportionality and ecological functionality of the Proposed Offsetting Lands. The justification for the choice of the Proposed Offsetting Lands are provided in Section 2.1.2 of Appendix 7-7, with 123.2 ha of lands being identified for restoration for the benefit of hen harrier.



Map Legend

- Proposed Offsetting Measures
- Predator Proof Fence

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Drawing Title
Proposed Offsetting Lands

Project Title
Taurbeg Wind Farm Extension of Operational Life

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MC	EMC
Project No.	Drawing No.
231030	Figure 4-8
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4.5.1 Forestry Removal and Restoration

The Proposed Offsetting Measures will be achieved by deforestation of approximately 105.5Ha of plantation forestry across the area to create new viable hen harrier habitat, and the works will consist of:

- Permanent removal of trees of approximately 10 HA (Area 2 only);
- Deforestation and stacking of felled material in windrows at 50m intervals of approximately 95.5 HA;

Deforestation ensures the provision of high-quality replacement peatland habitat to offset the loss of predominantly sub-optimal commercial forestry. Commercial forestry is associated with lower breeding success, is only of limited value to hen harrier while young and is of little to no ecological value once its canopy closes at c.12 years old.

Replanting of forestry will not occur within the Proposed Offsetting lands.

Where possible, existing drains will not be disturbed during deforestation works, with silt fences being installed at the outfalls of existing drains downstream of deforestation areas to prevent entry of sediment to watercourses. Drains and silt traps will be maintained throughout all deforestation works, ensuring that they are clear of sediment build-up and are not severely eroded. See Section 9.5.2.1 of Chapter 9 for further detail on drainage during deforestation works, including drain inspection and maintenance.

No further works such as drain blocking and re-wetting of peatland using peat dams or similar techniques are proposed. No forestry access tracks will be constructed. All Forest Service Archaeological, Environmental and Water Quality guidelines will be adhered to.

4.5.1.1 Deforestation Methodology

The deforestation methodology has been informed through consultation with a forestry contracting company. For the purposes of the forestry works, the Proposed Offsetting lands have been divided into four areas (Area 1- Area 4), as shown in Figure 4-8.

4.5.1.1.1 *Areas 1 and 4*

Given the age and quality of the forestry crops within Areas 1 and 4, it is proposed to stack felled material onsite within both of these areas. The methodology for this approach is as follows:

- The areas will be divided up in to windrows about 50m apart., as illustrated in Figure 4-9.
- A tracked excavator machine with shears/ harvester head (Machine 1) will cut the trees, and following this, the harvesting operator will swing around and drop the entire tree as far as needed (typically up to 12m from where it was cut)
- From here, the cut tree will be picked up by a second tracked excavator machine (Machine 2) with a dyke/rock bucket or grab.
- The tracked excavator machine will swing around again (c. 12m away) resulting in a windrow being located c. 24 meters from where furthest away trees were cut.
- The process would then be replicated from the other side so that a windrow (c. 2-3 m wide) comprising approximately 50m of crop is created.
- The tracked excavator machine will, using its attachment, compress the material so as to keep the windrows tight and as narrow as possible.

The existing good quality heath within firebreaks and along access tracks will be preserved by cordoning them off as ‘no go’ zones for machinery by a suitably qualified ECoW. No vehicle movements will take place within the existing large central firebreak of Area 1. This area contains

upland blanket bogs and wet heath habitat and will be retained as part of Proposed Offsetting Measures. Vehicle movements will be restricted within the small north-south existing firebreaks.

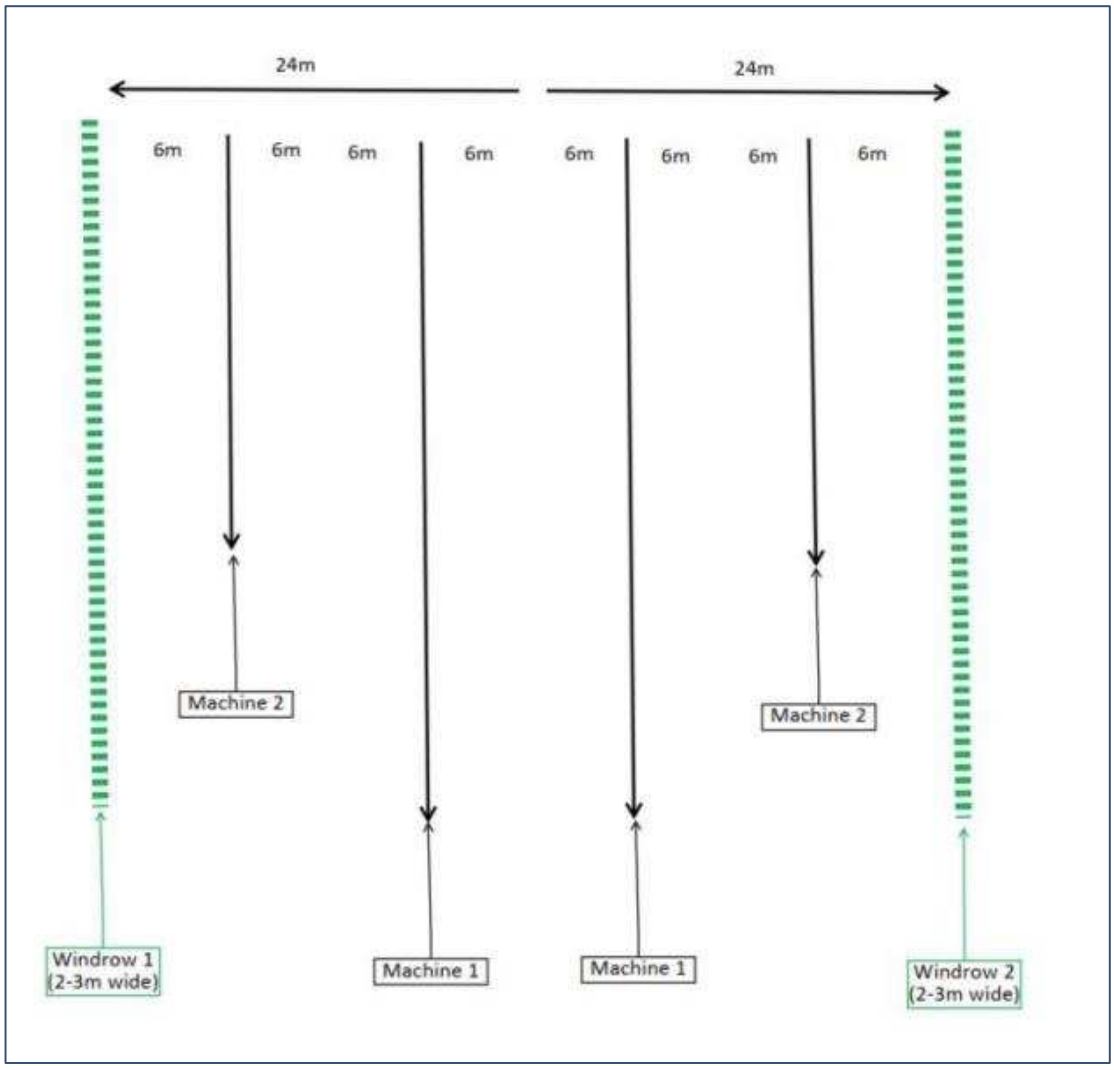

Figure 4-9 Windrows proposed at the Proposed Offsetting lands

4.5.1.1.2 Area 2

The forestry crop in Area 2 is considered to be higher quality and more productive. As such approximately 10 hectares of the forestry crop here will be harvested using the following methodology:

- The forestry crop will be cut using shears or a harvesting head on a tracked excavator.
- A forwarder will then draw all material (whole trees) to a temporary storage area near the existing entrance off the public road network (L10750).
- The forwarder will use temporary brash tracks to support the ground upon which it is travelling, bringing approximately 5 ton loads of entire trees to the storage area at a time.
- Brash will be replenished as required, should ground conditions disimprove in order to minimise the impact of machinery causing rutting.
- Felled forestry (estimated total volume c. 2,000 ton) will be left on site at the storage area for 4-6 months to dry out.
- Following this, a chipping machine will be brought on site, with the felled trees being chipped and blown into lorries for onward delivery to biomass plants.

Following deforestation in Areas 1, 2 and 4, these areas will be allowed to revert back to dry heath habitat. This will be done through planting of scrub within Areas 1 and 4 in order to create a diversity

of vegetation structures to provide cover and resources for hen harrier prey species. Scrub patches will be planted using a mix of bare-root saplings and 2-3 year old potted trees to provide some structural diversity and to maximise establishment success. Areas for planting will measure approximately 0.2ha in size and not exceed 10% of the total area of Areas 1, 2, or 4. The scrub will be distributed throughout the deforested areas. Patches of existing native scrub remaining following deforestation will be targeted through planting.

A Peat Stability Risk Assessment (Appendix 8-1) has been undertaken to identify any potential for peat instability which may be triggered by deforestation works. The peat stability risk assessment findings showed that the Proposed Offsetting lands have an acceptable margin of safety and low risk of peat failure and is suitable for the Proposed Offsetting.

4.5.2 Restoration of Farmland

Area 3 of the Proposed Offsetting lands consists of pastural agricultural land. The farmland is predominantly wet grassland with frequent stands of rushes (Juncus spp.), gorse and scrub. The restoration of the farmland to good quality hen harrier foraging habitat will be achieved by diversifying the range and extent of habitats within the Proposed Offsetting Lands with a particular focus on habitats that support prey species. Restoration measures have been selected based on guidance from the Hen Harrier Project[3].

The following restoration measures will be implemented in Area 3:

- Planting and restoring of hedgerow
- Rotational grazing scheme
- Linear wildlife crop sowing
- Cease on fertiliser application
- Predator Fencing

It is proposed that a suitably qualified environmental scientist or ornithologist/ecologist will be engaged by the Applicant to oversee the implementation of the Proposed Offsetting Measures and to guide the landowner on the various measures proposed.

4.5.3 Monitoring

Ongoing monitoring of the Proposed Offsetting lands is proposed to assess the effectiveness of the measures proposed and to contribute to advances in habitat management methods, which can be applied to future similar projects. Monitoring measures proposed at the Proposed Offsetting lands include:

- Breeding raptor surveys
- Passerine point counts
- Habitat mapping
- Habitat scoring
- Vegetation sampling

The Applicant will be responsible for the implementation of the Proposed Offsetting Measures. Annual audits will be required to ensure the effectiveness of the Proposed Offsetting Measures. They are essential to ensure adequate plan quality, compliance, and control. Audits will be based on a field inspection and the assessment of the farm plans.

[3] *Hen Harrier Project:* http://www.henharrierproject.ie/about.html

4.6 Extended Operational Stage

4.6.1 Operational

The Proposed Lifetime Extension is expected to have a lifespan of 10 years, commencing from the date of expiration of the existing Taurbeg Wind Farm permission in 2026.

During the extended operational period, on a day-to-day basis the wind turbines will operate automatically, responding by means of anemometry equipment and control systems to changes in wind speed and direction.

The monitoring of the turbine output, performance, wind speeds and responses to any key alarms will continue to be monitored. All operational works on-site will be carried out in strict adherence with the Applicant's Health and Safety Policies and Procedures.

4.6.2 Maintenance

Each turbine will continue to be subject to a routine maintenance programme involving monthly checks and intermittent changing of consumables, including oil changes. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes requiring a crane. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. The wind farm manager will continue to attend the site regularly to perform inspections and oversee maintenance works.

The maintenance contractor for Taurbeg Wind Farm will be responsible for ensuring each turbine is well maintained. Each turbine is subject to a yearly maintenance schedule which includes, yearly master maintenance and visual blade inspections. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes. The use of a crane on site may be required but this is only for major component repairs/change. All site roads and public roads are suitable for this access if required and no modifications are required. Typically, maintenance traffic will consist of four-wheel drive LGVs. The wind farm manager will continue to attend the site regularly to perform inspections and oversee maintenance works.

The onsite substation and site tracks will also require periodic maintenance. The existing Taurbeg 38kV Substation will continue to be operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link.

The following maintenance procedures will also be adhered:

- Periodic service and maintenance works which include some vehicle movement.
- For operational and inspection purposes, substation access is required.
- Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following:
    - Yearly service – one day visit
    - 4-year master maintenance – two day visit

Occasional technical problems may require maintenance visits by technical staff. During the service visits, some waste (lubricating and cooling oils, packaging from spare parts or equipment, unused paint, etc.) will arise. This will be recorded and removed from the Wind Farm Site and reused, recycled or disposed of in accordance with the relevant legislation in an authorised facility.

It is estimated that 1-2 daily visits will be made to the Site for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required. Although the level of activity required for the maintenance of the both the existing Taurbeg Wind Farm and existing Taurbeg 38kV Substation infrastructure is minimal.

An Operation and Environmental Management Plan (OEMP) has been prepared for the Proposed Project and is included as Appendix 4-2 of this EIAR.

4.6.3 Monitoring

Section 5 of the OEMP sets out a programme of monitoring required for the Proposed Lifetime Extension. The OEMP should be consulted for detailed information on the monitoring requirements during the extended operational phase, however a brief summary of the key information is provided below:

4.7 Decommissioning Stage

Decommissioning of the existing Taurbeg Wind Farm is required to be carried out 20 years from the date of commissioning of the wind farm, under the parent planning permission. The Proposed Lifetime Extension would extend the operation of the existing wind farm for a further ten years, thereby postponing decommissioning until 2036.

Condition 7 of the original permission states:

> "*The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development.*"

A Decommissioning Plan is presented in Appendix 4-3 of this EIAR and outlined below.

Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above-ground turbine components will be separated and removed off-site for reuse or recycling. The on-site substation will remain in place as it will become a permanent part of the national electricity network.

The Applicant has made a commitment not to send turbine blades to a landfill.

It is proposed to leave turbine foundations in place underground and to cover them with earth and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.

It is proposed that site roadways will be left in situ, as appropriate, as these are in use by the participating landowners to access their lands and as existing walking trails. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed where required, however, this is not envisaged at this time. It is proposed to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works.

During decommissioning, it may be possible to reverse or at least reduce some of the potential impacts caused during the initial construction of the wind farm by rehabilitating construction areas such as turbine bases and hard standing areas. This will be done by covering with local topsoil and reseeding with a local native mix to encourage vegetation growth and reduce run-off and sedimentation.

In November 2020, Wind Europe published the 'Decommissioning of Onshore Wind Turbines'[4] in which EU-wide industry guidelines were amalgamated and put forward. This document was submitted to the International Electrotechnical Commission TC88 for Wind Turbines, as a starting point towards the creation of an international standard for the decommissioning of onshore wind turbines. These guidelines present the main steps a decommissioning project should perform. This document outlines that the decommissioning plan is the key document for the decommissioning of a wind farm. A decommissioning plan of a wind farm must reflect national and, in some cases, regional or local legislation. The guidelines provided in this document provide key examples of decommissioning plans from several European countries, including Germany, France, Denmark and the Netherlands. Wind turbines are a valuable source of resources that can be reintroduced into the circular economy. The aim should be for use over a long period of time. However, at some point, wind turbines need to be decommissioned as they reach the end of their operational life. The 'Decommissioning of Onshore Wind Turbines' report therefore presents a number of scenarios in which wind turbines can be decommissioned in a safe and more sensitive manner than has been put forward in the past.

As noted in the Scottish Natural Heritage (SNH) report *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms*[5] (SNH, 2013) reinstatement proposals for a wind farm are typically made far in advance, so within the proposed 10-year extension of operation of the site, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm"*.

The final Decommissioning Plan will therefore be agreed with the Local Authority at least three months prior to decommissioning of the existing Taurbeg Wind Farm.

[4] *Wind Europe Decommissioning of Onshore Wind Turbines. Available at: https://windeurope.org/intelligence-platform/product/decommissioning-of-onshore-wind-turbines/*
[5] *Scottish Natural Heritage Commissioned Report No. 591 Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms. Available at: https://www.nature.scot/sites/default/files/2017-07/Publication%202013%20-%20SNH%20Commissioned%20Report%20591%20-%20Research%20and%20guidance%20on%20restoration%20and%20decommissioning%20of%20onshore%20wind%20farms.pdf*

Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

Chapter 5 – Population and Human Health

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5. POPULATION AND HUMAN HEALTH

5.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) identifies, describes and assesses the potential significant effects of the Proposed Project on population and human health and has been completed in accordance with the guidance set out by the Environmental Protection Agency (EPA), in particular the '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2022) and Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU and as transposed into Irish Law through Regulations in 2018 (S.I. No. 296 of 2018).

Please see section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

Impacts of a proposed development that may impinge on human health, directly and indirectly, positively and negatively have been considered. The key issues examined in this chapter of the EIAR include employment, settlement and land use patterns, population and demographic trends, tourism and amenity, and human health (health and safety and shadow flicker). Vulnerability of the project to risk of major accidents and /or disasters is dealt with separately. Please see Chapter 16 Vulnerability to Natural Disasters for further details.

5.1.1 Statement of Authority

This section of the EIAR has been prepared by Natalia Stolarska and Micheal Cahill and reviewed by Eoin McCarthy, of MKO. Natalia is an Environmental Scientist with MKO having joined the company in September 2023. Since joining MKO, Natalia has become a member of the MKO Environmental Renewables Team which work on producing high quality Environmental Impact Assessment Reports for a variety of Renewable Energy clients.

Michéal Cahill is a Graduate Environmental Scientist with MKO with almost 1 years' experience in environmental consultancy. Michéal holds a first-class honours degree in Environmental Science at University of Galway and was awarded the Professor Emer Colleran Medal for his academic achievements. Prior to taking up his position with MKO in June 2024, Michéal previously worked as an environmental sustainability intern with RPS Group. Michéal has previous experience in the preparation and review of Environmental Impact Assessment Reports for both offshore and onshore wind farm projects, as well as aiding in the research and design phase of a proposed pumped hydroelectric storage plant.

Eoin is a Project Director with over 13 years of environmental consultancy experience. Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway. Eoin took up his position with MKO in June 2011. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment.

5.1.2 Relevant Guidelines and Sources

In addition to the guidelines set out in the EPA 2022 report and Directive 2011/92/EU as amended by Directive 2014/52/EU, the following guidelines, plans and reports have also informed the preparation of this chapter:

- Department of Health – Health in Ireland: Key Trends 2022;

- Department of Housing, Planning and Local Government (DoHPLG), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018);
- European Commission (EC), Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017);
- Department of the Environment, Heritage and Local Government Wind Energy Development Guidelines (2006);
- Department of the Environment, Heritage and Local Government Draft Wind Energy Development Guidelines (2019);
- Environmental Impact Assessment of National Road Schemes- A practical Guide, National Roads Authority/ Transport Infrastructure Ireland, Revision 1, November 2008;
- Fáilte Ireland EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects, July 2023.
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2022)
- Health Impact Assessment Resource and Tool Compilation, United States Environmental Protection Agency 2016;
- Health Impact Assessment Guidance, Institute of Public Health Ireland. 2009;
- Framework for Human Health Risk Assessment to Inform Decision Making developed by the United States Environmental Protection Agency (US EPA) 2014;
- Institute for Environmental Management and Assessment (2017) Health In Environmental Impact Assessment: A Primer for a Proportionate Assessment;
- Institute for Environmental Management and Assessment (2022) Determining Significance for Human Health in Environmental Impact Assessment;
- Central Statistics Office (CSO): Census of Ireland 2016; Census of Ireland 2022; Census of Agriculture 2020;
- Cork County Development Plan 2022-2028;
- The World Health Organisation (WHO) Environmental Noise Guidelines for the European Region (WHO, 2022 Update) https://www.who.int/
- Best Practice Guidelines for the Irish Wind Energy Industry, IWEA, 2012.

5.1.3 Scoping

Section 2.9 of Chapter 2 of this EIAR describes the scoping and consultation exercise undertaken for the Proposed Lifetime Extension. The replies to the EIAR scoping exercise that are relevant to this chapter are set out below.

Health Service Executive

A scoping response was received from the Health Service Executive (HSE) on the 20th March 2024. The HSE requested a shadow flicker assessment is undertaken to identify any Sensitive Receptors which may be impacted by shadow flicker and noted that the assessment must include all proposed mitigation measures, including air quality due to the nature of the proposed construction works, generation of airborne dust has the potential to have significant impacts Sensitive Receptors. The response stated that a Construction Environmental Management Plan (CEMP) should be included in the EIAR which details dust control and mitigation measures. It should be noted that no construction works will be carried out as part of this project, therefore a CEMP will not be necessary. The HSE further stated that the Environmental Impact Assessment should examine all likely significant impacts and provide the following information for each:

- Description of the receiving environment;
- The nature and scale of the impact;
- An assessment of the significance of the impact;

- Proposed mitigation measures;
- Residual impacts.

Directive 2014/52/EU has an enhanced requirement to assess likely significant impacts on Population and Human Health. It is the experience of the Environmental Health Service (EHS) that impacts on human health are often inadequately assessed in EIAs in Ireland. It is recommended that the wider determinants of health and wellbeing are considered in a proportionate manner when considering the EIA. Guidance on wider determinants of health can be found at www.publichealth.ie.

The HSE advised that in addition to any likely significant negative impacts from the Proposed Lifetime Extension, any positive likely significant impacts should also be assessed.

The Environmental Health Service (EHS) recommends that the following matters are included and assessed in the EIAR:

- Public Consultation
- Population and Human Health
- Water (Hydrology and Hydrogeology)
- Land and Soils
- Air, Dust and Odour
- Climate Change and Opportunity for Health Gain
- Noise and Vibration
- Waste Management
- Ancillary Facilities
- Cumulative Impacts

These recommended matters have been included and assessed in the EIAR, with matters relating to:

- Population and human health being discussed in Chapter 5 Population and Human Health
- Water being discussed in Chapter 9 Hydrology and Hydrogeology
- Land and soils being discussed in Chapter 8 Geology and Soils
- Air, dust and odour being discussed in Chapter 10 Air Quality
- Climate change being discussed in Chapter 11 Climate
- Noise and vibration being discussed in Chapter 12 Noise
- Waste management and ancillary facilities being discussed in Chapter 15 Material Assets

Furthermore, as recommended a shadow flicker assessment has been carried out for the Proposed Lifetime Extension in Section 5.5. The EIAR includes a description of the receiving environment in Chapter 4, with each chapter assessing impacts in relation to the:

- Nature and scale of the impact
- An assessment of the significance of the impact
- Proposed mitigation measures
- Residual impacts

Cumulative impacts are also assessed, with cumulative impacts on population and human health being assessed in Section 5.6.4.

Uisce Éireann

Uisce Éireann provided a response to a scoping request on the 7th of March 2024, outlining the measures for consideration in the scope of an Environmental Impact Assessment (EIA). This includes steps to avoid any adverse effects on Irish Water's Drinking Water Source(s) during both the construction and operational phases of a development, as well as an assessment of potential impacts on nearby public water supply infrastructure.

Recommendations proposed by Uisce Éireann have been accounted for in Chapter 9 Hydrology and Hydrogeology and Chapter 15 Material Assets.

Fáilte Ireland

A scoping response was received from Fáilte Ireland on the 14th of March 2024 and provided the 'Fáilte Ireland's Guidelines for the Treatment of Tourism in an EIA', to inform the preparation of the Environmental Impact Assessment for the Proposed Lifetime Extension. The report provides guidance for those conducting Environmental Impact Assessment and compiling an Environmental Impact Assessment Report (EIAR), or those assessing EIARs, where the project involves tourism or may have an impact upon tourism (see Section 5.3.8 and Section 5.6.2.1.5, below, for further detail). These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines outlined in section 2 of the guidance document, including some of the key requirements for an EIAR under the current guidance:

- Project description;
- Assessment of alternatives considered;
- Baseline assessment;
- Assessment of effects;
- Cumulative impacts
- Interaction of impacts;
- Mitigation & monitoring; and
- Residual impacts

A project description is provided in Section 4.1 of Chapter 4, with an assessment of alternative to the Proposed Project being discussed in Chapter 3 Reasonable Alternatives. Furthermore, the following matters have bene discussed across all impact assessment chapters of this EIAR:

- Baseline assessment;
- Assessment of effects;
- Cumulative impacts
- Interaction of impacts;
- Mitigation & monitoring; and
- Residual impacts

5.1.4 Health and Safety

5.1.4.1 Turbine Safety

Turbines pose no threat to the health and safety of the general public. The 2006 WEDGs and the 2019 draft WEDGs iterate that there are no specific safety considerations in relation to the operation of wind turbines. Fencing or other restrictions are not necessary for safety considerations and should be kept to a minimum. People or animals can safely walk up to the base of the turbines.

The 2006 WEDGs and the 2019 draft WEDGs state that there is a very remote possibility of injury to people from flying fragments of ice or from a damaged blade. Modern turbine blades are composite structures with no bolts or separate components; therefore, danger is minimised. Furthermore, the proposed wind turbines will be fitted with anti-vibration sensors which will detect any imbalance caused by icing of the blades. These sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation. As such, turbines are designed in such a way that ice throw/projection is not a significant risk. Furthermore, the Site (and the State) falls within the International Energy Agency (IEA) Ice Class 1 category[1], which correlates to a *Low* icing frequency.

[1] *Wind Power Icing Atlas (WIceAtlas) – IEA Ice Class 1 Category for Ireland (map). Available at: https://vtt.maps.arcgis.com/apps/instant/minimalist/index.html?appid=6d93b5e284104d54b4fb6fd36903e742*

The International Electrotechnical Commission (IEC) is a global organization that develops and publishes international standards for electrical and electronic technologies. One of the areas where the IEC has played a significant role is in the standardization of wind turbines. The IEC has developed a series of standards specifically for wind turbines, which cover various aspects such as design, testing, and performance. The IEC 61400-1 "Wind turbines – Part 1: Design requirements" provides guidelines and requirements for the design of wind turbines, including considerations for environmental conditions[3]. This standard covers a range of conditions that wind turbines may encounter, including those related to icing. It sets out criteria for the structural design, safety systems, and other aspects to ensure that wind turbines can operate safely and effectively in various environments.[4] As such, the Proposed Lifetime Extension, and like those across Ireland and in many other countries, is generally designed and assessed according to international standards, with the IEC standards being frequently employed in this process. Additionally, regulatory entities and energy authorities at the national level, such as the SEAI, often refer to and align their guidance with internationally recognized standards, including those established by the IEC, such as IEC 61400-1 for wind turbines. In conclusion, the Proposed Lifetime Extension adheres to the criteria specified in both the IEC 61400-1 design requirements and the SEAI guidance

Turbine blades are manufactured of glass reinforced plastic which will prevent any likelihood of an increase in lightning strikes within the site or the local area. Lightning protection conduits are integral to the construction of the turbines. Lightning conduction cables, encased in protection conduits, follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables are earthed adjacent to the turbine base. The earthing system was installed during the construction of the turbine foundations.

5.1.4.2 Electromagnetic Interference

The provision of underground electric cables of the capacity proposed is common practice throughout the country and installation to the required specification does not give rise to any specific health concerns.

The extremely low frequency (ELF) electric and magnetic fields (EMF) associated with the operation of the proposed cables fully comply with the international guidelines for ELF-EMF set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a formal advisory agency to the World Health Organisation, as well as the EU guidelines for human exposure to EMF. Accordingly, there will be no operational impact on properties (residential or other uses) as the ICNIRP guidelines will not be exceeded at any distances even directly above the cables.

The ESB document 'EMF & You' (ESB, 2017)[2] provides further practical information on EMF. Further details on the potential impacts of electromagnetic interference to telecommunications and aviation are presented in Chapter 15: Material Assets.

Further details on the potential effects of electromagnetic interference to telecommunications and aviation are presented in Chapter 15: Material Assets.

5.2 Assessment Methodology

[2] *ESB 2017 EMF & You'. Available at: https://esb.ie/docs/default-source/default-document-library/emf-public-information_booklet_v9.pdf?sfvrsn=0)*

5.2.1 Population

A desk-based assessment using sources and guidelines referenced in Section 5.1.2 above was undertaken to examine relevant information pertaining to the population impact assessment. Information on population statistics, employment and social data for the relevant Electoral Divisions (EDs) were obtained from the Central Statistics Office (CSO) for census year 2022. Fáilte Ireland's EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects was also considered in this assessment. See Section 5.3.8 below.

The Population Study Areas for this assessment focuses on the electoral divisions (ED) within which the Proposed Lifetime Extension and Proposed Offsetting Measures are located, namely Clonfert East and Mount Eagle, but it also refers to county and national statistics.

5.2.2 Human Health

This human health analysis Section was assessed using guidelines set out in Section 5.1.2 above.

The World Health Organisation's (WHO) defines health as:

> *"A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".*[3]

5.2.2.1 National Guidance

In 2022 the Environmental Protect Agency published EIAR Guidelines which state that "*in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g., under the environmental factors of air, water, soil etc.*" Environmental Impacts from the Proposed Lifetime Extension which may also have an impact on population and human health are discussed in this chapter but addressed in more detail in the following chapters: Chapter 8 Land Soil and Geology, Chapter 9 Hydrology and Hydrogeology, Chapter 10 Air Quality, Chapter 11 Climate, Chapter 12 Noise and Vibration, Chapter 13 Landscape and Visual, Chapter 15 Material Assets (including Traffic and Transport).

As referenced in the Department of Housing, Planning and Local Government (2018) *Guidelines for Planning Authorities and An Bord Pleanála*, (taken from the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017)), human health is, "*a very broad factor that would be highly project dependent.*" The report continues:

> *'The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.'*

[3] *World Health Organisation Constitution Available at: https://www.who.int/about/governance/constitution*

The EPA 2022 EIAR Guidelines[4] state that while no specific guidance on the meaning of the term Human Health has been issued in the context of Directive 2014/52/EU, the same term was used in Section 3.3.6 the SEA Directive (2001/42/EC). The European Commission's SEA Implementation Guidance[5] states *'The notion of human health should be considered in the context of the other issues mentioned in paragraph (f) of the Directive, where paragraph f lists environmental factors such as soils, water, landscape, air etc. The Guidelines state that this approach is 'consistent with the approach set out in the 2002 EPA Guidelines where health was considered through assessment of the environmental pathways through which it could be affected, such as air, water or soil'*. The EPA 2022 EIAR Guidelines note that the above approach follows the 2002 EPA guidelines already in place which details the following:

> *'The evaluation of effects on these pathways is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment'.*

5.2.2.2 IEMA Guidance 2017

The Institute for Environmental Management and Assessment (IEMA) published 'Health in Environmental Impact Assessment: A Primer for a Proportionate Assessment' in 2017 examining what a proportionate assessment of the impacts on health should be in Environmental Impact Assessments. The document. The document states that Health Impact Assessment (HIA) and EIA are separate processes.

> *"HIA is defined as a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, programme or project on both the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects... [...] ... HIA can inform EIA practice in relation to population and human health but conducting a HIA will not necessarily meet the EIA population and human health requirement. By the same token, conducting an EIA will not automatically meet the requirements of a HIA."*

The Primer Assessment Report acknowledges that 'disproportionate burdens maybe placed on developers if HIA is applied as a proxy for the consideration of population and human health in every future UK EIA'. The focus of EIA should be on predicting health and wellbeing outcomes, rather than focusing on changes in determinants of health e.g., expected changes in noise levels. Determining the significance of impacts on population and human health should include a professional judgement, scientific literature; consultation responses; comparison with baseline conditions; local health priorities; and national/international regulatory standards and guidelines. The primer report refers to the WHO 2014 which provides and overview of health in different types of assessment:

> *"The health sector, by crafting and promoting HIA, can be regarded as contributing to fragmentation among impact assessments. Health issues can, and need to, be included [in impact assessment] irrespective of levels of integration. At the same time, from a civic society perspective, it would be unacceptable for HIA to weaken other impact assessments. A prudent attitude suggests optimizing the coverage of health along all three avenues:*
>
> - better consideration of health in existing impact assessments other than HIA;

[4] *Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)https://www.epa.ie/publications/monitoring–assessment/assessment/EIAR_Guidelines_2022_Web.pdf*
[5] *IMPLEMENTATION OF DIRECTIVE 2001/42 ON THE ASSESSMENT OF THE EFFECTS OF CERTAIN PLANS AND PROGRAMMES ON THE ENVIRONMENT, Available at: https://wayback.archive-it.org/12090/20151221015216/http://ec.europa.eu/environment/archives/eia/pdf/030923_sea_guidance.pdf*

- dedicated HIA;
- and integrated forms of impact assessment."

As such, the WHO does not support a stand-alone HIA unless it could be demonstrated to be of advantage over an EIAR. Therefore, given that this human health assessment is part of the EIAR; there is no stand-alone HIA.

5.2.2.3 EIA Significance Matrix for Human Health, IEMA Guidance 2022

The IEMA Working Group 2022 published 'Determining Significance For Human Health in Environmental Impact Assessment' in response to gaps and inconsistencies across existing guidance documents as to how health is assessed in EIA, particularly with regard to significance. The aim of this report is to assist and streamline discussions for consultants producing the assessments and for the decision makers who are reviewing the assessments. The report states that an EIA must identify, describe and assess the direct and indirect significant effects in an appropriate manner of a proposed development on human health. It must include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects, taking into account current knowledge and methods of assessment.

5.2.3 Shadow Flicker

5.2.3.1 Background

The assessment methodology in this chapter follows the current adopted guidance for shadow flicker in Ireland is derived from the 2006 WEDGs and the 'Best Practice Guidelines for the Irish Wind Energy Industry' (Irish Wind Energy Association, 2012).

Shadow is an effect that occurs when rotating wind turbine blades cast shadows at a nearby property. Shadow flicker is an indoor phenomenon, which may be experienced by an occupant sitting in an enclosed room when sunlight reaching the window is momentarily interrupted by a shadow of a wind turbine's blade. Outside in the open, light reaches a viewer (person) from a much less focused source than it would through a window of an enclosed room, and therefore shadow flicker assessments have been undertaken for the nearby adjacent properties around the existing Taurbeg Wind Farm. The frequency of occurrence and the strength of any potential shadow flicker impact depends on several factors which are listed *in the Update of UK Shadow Flicker Evidence Base Department of Energy and Climate Change*[6] report and repeated in the 2019 draft WEDGs.

1. ***Whether the sunlight is direct and unobstructed or diffused by clouds:***

If the sun is not shining, shadow flicker cannot occur. Reduced visibility conditions such as clouds, haze, and fog greatly reduce the chance of shadow flicker occurring.

Cloud amounts are reported as the number of eights (okta) of the sky covered. Irish skies are completely covered by cloud for over 50% of the time. The mean cloud amount for each hour is between five and six okta. This is due to Ireland's geographical position off the northwest of Europe, close to the path of Atlantic low-pressure systems which tend to keep the country in humid, cloudy airflows for much of the time. A study at 12 weather stations over a 25-year period showed that the mean cloud amount was at a minimum in April and maximum in July. Cloud amounts were less at

[6] *Parsons Brinckerhoff (2010) Update of UK Shadow Flicker Evidence Base Department of Energy and Climate Change. Department of Energy and Climate Change. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48052/1416-update-uk-shadow-flicker-evidence-base.pdf*

night than during the day, with the mean minimum occurring roughly between 2100 and 0100 GMT and the mean maximum occurring between 1000 and 1500 GMT at most stations. (Source: Met Éireann, www.met.ie).

2. ***The presence of intervening obstructions between the turbine and the observer:***

For shadow flicker to occur, the windows of a potentially affected property must have direct visibility of a wind turbine, with no physical obstructions such as buildings, trees and hedgerows, hills or other structures located on the intervening land between the window and the turbine.

Any obstacles such as trees or buildings located between a property and the wind turbine will reduce or eliminate the occurrence and/or intensity of the shadow flicker.

3. ***How high the sun is in the sky at a given time:***

At distances of greater than approximately 500m between a turbine and a receptor, shadow flicker generally occurs only at sunrise or sunset when the shadow cast by the turbine is longer. The 2006 WEDGs, iterates that at distances greater than ten rotor diameters from a turbine, the potential for shadow flicker is very low.

Figure 5-1 illustrates the shadow cast by a turbine at various times during the day; the red shading represents the area where shadow flicker may occur. When the sun is high in the sky, the length of the shadow cast by the turbine is significantly shorter.

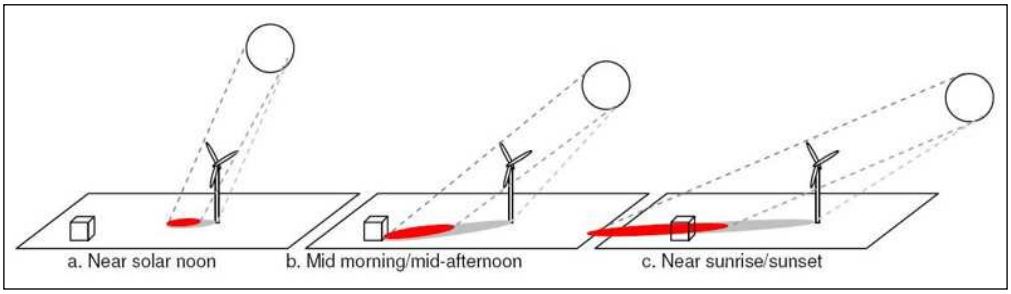

Figure 5-1 Shadow-Prone Area as Function of Time of Day (Source: Shadow Flicker Report, Helimax Energy, Dec 2008)

4. ***Distance and bearing, i.e., where the property is located relative to a turbine and the sun:***

The further a property is from the turbine the less pronounced the effect will be. There are several reasons for this: there are fewer times when the sun is low enough to cast a long shadow; when the sun is low it is more likely to be obscured by either cloud on the horizon or intervening buildings and vegetation; and the centre of the rotor's shadow passes more quickly over the land reducing the duration of the impact.

At a distance, the turbine blades do not cover the sun but only partly mask it, substantially weakening the shadow. This effect occurs first with the shadow from the blade tip, the tips being thinner in section than the rest of the blade. The shadows from the tips extend the furthest and so only a very weak impact is observed at distance from the turbines. (Source: Update of Shadow Flicker Evidence Base, UK Department of Energy and Climate Change, 2010).

5. ***Property usage and occupancy:***

Where shadow flicker is predicted to occur at a specific location, this does not imply that it will be witnessed. Potential occupants of a property may be sleeping or occupying a room on another side of the property that is not subject to shadow flicker, or completely absent from the location during the

time of shadow flicker events. As shadow flicker usually occurs only when the sun is at a low angle in the sky, i.e., very early in the morning after sunrise or late in the evening before sunset, even if there is a bedroom on the side of the property affected, the shadow flicker may not be witnessed if curtains or blinds in the bedroom are closed.

6. ***Wind direction, i.e. position of the turbine blades:***

The direction of wind turbine blades changes according to wind direction, as the turbine rotor turns to face the wind. In order to cast a shadow, the turbine blades must be facing directly toward or away from the sun, so they are moving across the source of the light relative to the observer. This is demonstrated in Figure 5-2.

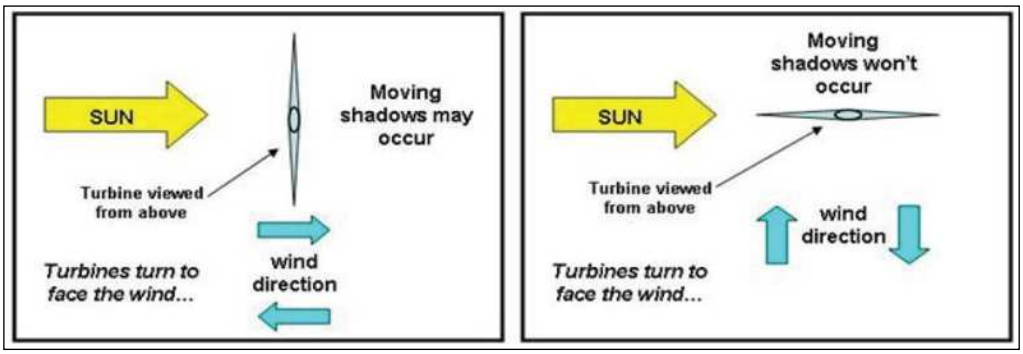

Figure 5-2: Turbine Blade Position and Shadow Flicker Impact (Source: Wind Fact Sheet: Shadow Flicker, Noise Environment Power LLC

7. ***Rotation of turbine blades:***

Shadow flicker occurs only if there is sufficient wind for the turbine blades to be continually rotating. Wind turbines begin operating at a specific wind speed referred to as the 'cut-in speed', i.e., the speed at which the turbine produces a net power output, and they cease operating at a specific 'cut-out speed'. Therefore, even during the sunlight hours when shadow flicker has been predicted to occur, if the turbine blades are not turning due to insufficient wind speed, no shadow flicker will occur.

5.2.3.2 Guidance

The current adopted guidance for shadow flicker in Ireland is derived from the 2006 WEDGs and the 'Best Practice Guidelines for the Irish Wind Energy Industry' (Irish Wind Energy Association, 2012). The 2006 WEDGs state that at distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low. Therefore, the study area adopted for the shadow flicker assessment is 10 rotor diameters of the existing turbine locations (i.e. for the Proposed Lifetime Extension, this is assumed at 824m based on a rotor diameter of 82.4 metres). There are 2 no. Sensitive Receptors (H10 and H33) within the Study Area.

The 2006 WEDGs recommend that shadow flicker at neighbouring offices and dwellings within 500 metres of an existing turbine location should not exceed a total of 30 hours per year or 30 minutes per day. The Taurbeg Wind Farm was granted permission prior to the 2006 WEDGs being published. However, as shown in Section 5.5.1 there is no shadow flicker predicted for houses in the study area. Therefore, the existing turbines comply with the 2006 WEDGs.

The 2006 WEDGs are currently under review. The DoHPLG released the 2019 draft WEDGs which were released for public consultation in December 2019. The consultation period closed in February 2020; however, no update or final guidelines were released. The 2019 draft WEDGs recommended local planning authorities and/or An Bord Pleanála impose conditions to ensure that:

"no existing dwelling or other affected property will experience shadow flicker as a result of the wind energy development subject of the planning application and the wind energy development shall be

installed and operated in accordance with the shadow flicker study submitted to accompany the planning application, including any mitigation measures required."

The 2019 draft WEDGs are based on the recommendations set out in the 'Proposed Revisions to Wind Energy Development Guidelines 2006 – Targeted Review' (December 2013) and the 'Review of the Wind Energy Development Guidelines 2006 – Preferred Draft Approach' (June 2017). The Climate Action Plan 2025 published in April 2025 does not state when the revised Wind Energy Guidelines will be issued. At the time of submission of this application, there has been no public consultation or finalisation of new guidelines.

5.2.3.3 Shadow Flicker Prediction Methodology

The occurrence of shadow flicker can be precisely predicted using specialist computer software programmes specifically developed for the wind energy industry, such as ReSoft WindFarm, WindPRO, WindFarmer (DNV.GL) or AWS OpenWind. The computer modelling of the occurrence and magnitude of shadow flicker is made possible by the fact that the sun rises and sets in the same position in the sky on every day each year.

Any potential impact can be precisely modelled to give the start and end time of any incidence of shadow flicker, at any location, on any day or all days of the year when it might occur. Where a shadow flicker impact is predicted to occur, the total maximum daily and annual durations can be predicted, along with the total number of days. Any incidence of predicted shadow flicker can be attributed to a particular turbine or group of turbines to allow effective mitigation strategies to be planned and proposed as detailed further below.

For the purposes of this shadow flicker assessment, the software package WindPRO version 4.0.423 has been used to predict the level of shadow flicker associated with the Proposed Lifetime Extension. Wind PRO is a commercially available software tool that enables developers to analyse, design and optimise wind farm designs. It allows existing turbine layouts to be optimised for maximum energy yield whilst taking account of environmental, planning and engineering constraints. WindPRO is one of the three key computer models used by the industry and it has been shown that the outputs of these packages do not have significant differences between them.[7]

5.2.3.4 Shadow Flicker Study Area

At the outset of the project, during the constraints mapping process, all sensitive receptors within 2km of the Proposed Lifetime Extension were identified and mapped. In addition, a planning history search to identify properties that may have been granted planning permission, but not yet been constructed, was carried out. These properties were also added to the sensitive receptors' dataset.

For the purposes of this assessment, a 'Sensitive Receptor' has been defined as a habitable dwelling.

The Shadow Flicker Study Area for the shadow flicker assessment is ten times the rotor diameter (82.4m rotor diameter x 10 = 824m) in accordance with the 2006 WEDGs. There are 2 no. Sensitive Receptors located within the Study Area – H10 which is 731m from T8 and H33 which is 821m from T8. However, there is 1 no. Sensitive Receptor (H28) located at 829m from T10 which is outside of the Study Area but for completeness, it is included in the Shadow Flicker Study Area. The Shadow Flicker software modelled 3 no. Sensitive Receptors for potential shadow flicker impact. None of these properties are theoretically predicted to experience shadow flicker. The Shadow Flicker Study Area and Sensitive Receptors locations are shown in Figure 5-3.

[7] *Parsons Brinckerhoff (2010) Update of UK Shadow Flicker Evidence Base Department of Energy and Climate Change. Department of Energy and Climate Change. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48052/1416-update-uk-shadow-flicker-evidence-base.pdf*

Map Legend

- Taurbeg EIAR Site Boundary
- Existing Turbines
- Shadow Flicker Study Area (824m)
- Sensitive Receptors in Shadow Flicker Study Area

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Drawing Title
Shadow Flicker Study Area

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
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5.2.3.4.1 Assumptions and Limitations

Due to the latitude of Ireland shadow flicker impacts are only possible at properties 130 degrees either side of north (i.e., a shadow flicker event can occur within a 260-degree span), as turbines do not cast shadows on their southern side[8]. As such properties located outside of this potential shadow flicker zone (50 degrees either side of south) will not be impacted. However, in this assessment, all 4 no. Sensitive Receptors within 360 degrees of the existing turbine locations out to 824m were assessed for shadow flicker impact.

At each property, and or the purposes of this shadow flicker assessment, the software package WindPRO version 4.0.423 has been used to predict the level of shadow flicker associated with the Proposed Lifetime Extension. The WindPRO modelling software produced shadow flicker calculations based on 4 No. notional windows facing north, east, south and west, labelled Windows 1, 2, 3 and 4 respectively. The methodology below is standard for all modelling software packages and cannot be manipulated per site i.e., the conservative approach of assuming shadow flicker from the north, south, east and west of each receptor is modelled. The degrees from north value for each window is:

- Window 1: 0 degrees from North
- Window 2: 90 degrees from North
- Window 3: 180 degrees from North
- Window 4: 270 degrees from North

Each window measures one-metre-high by one-metre-wide and is assumed to be vertical. The centre height of each window is assumed to be two metres above ground level and no screening due to trees or other buildings or vegetation is assumed. It was not considered necessary or practical to measure the dimensions of every window on every property in the study area. While the actual size of a window will marginally influence the incidence and duration of any potential shadow flicker impact, with larger windows resulting in slightly longer shadow flicker durations.

The following assumptions are considered in software modelling output for shadow flicker:

- The sun is assumed to be in clear cloudless skies at all times such that a noticeable shadow is cast. This will not occur in reality.
- The wind is always assumed to be within the operating range of the turbines such that the turbine rotor is turning at all times, thus enabling a periodic shadow flicker.
- The wind direction is assumed to be worst case with the turbine rotor always facing the house to present its maximum aspect to receptors in all directions.

These conservative assumptions calculate all potential times during the year that shadow flicker has the potential to occur at each property. In reality however, the sky will not be cloudless during all daytime hours, wind will not blow at all times, nor will it blow in a constant direction during times when shadow flicker may occur. The total annual shadow flicker calculated for each property assumes 100% sunshine during daytime hours, as referred to above. However, weather data for this region shows that the sun shines on average for 33.4% of the daylight hours per year. This percentage is based on Met Éireann data recorded at Cork Airport, the nearest meteorological station, over the 30-year period from 1991 to 2020 (www.met.ie). The actual sunshine hours within the Shadow Flicker Study Area and therefore the percentage of time shadow flicker could actually occur is 33.4% of the predicted hours. Table 5-18 below lists the annual shadow flicker calculated for each property when the regional average of 33.4% sunshine is taken into account, to give a more accurate annual average shadow flicker prediction. Table

[8] *House of Commons ODPM Annual Report and Accounts 2004: Housing, Planning, Local Government and the Regions Committee; Planning Policy Statement 22*
Department of Housing, Planning and Local Government Dec 2019 Draft Revised Wind Energy Development Guidelines. Rialtas Na hÉireann. Available at: https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/

5-18 in Section 5.5 of this chapter also outlines whether a shadow flicker mitigation strategy is required for each property to mitigate potential exceedances of the daily and/or annual threshold figure.

5.3 Population

5.3.1 Receiving Environment

5.3.1.1 Proposed Lifetime Extension

Information regarding population and general socio-economic data were sourced from the Central Statistics Office (CSO), the County Cork County Development Plan 2022-2028, Fáilte Ireland and the literature and guidelines as listed in Section 5.1.2 above.

The study included an examination of the population and employment characteristics of the area. This information was sourced from the Census of Ireland 2022, the most recent census for which a complete dataset is available, also the Census of Ireland 2016, the Census of Agriculture 2020 and from the CSO website (www.cso.ie). Census information is divided into State, Provincial, County, Major Town, and Electoral Division (ED) level.

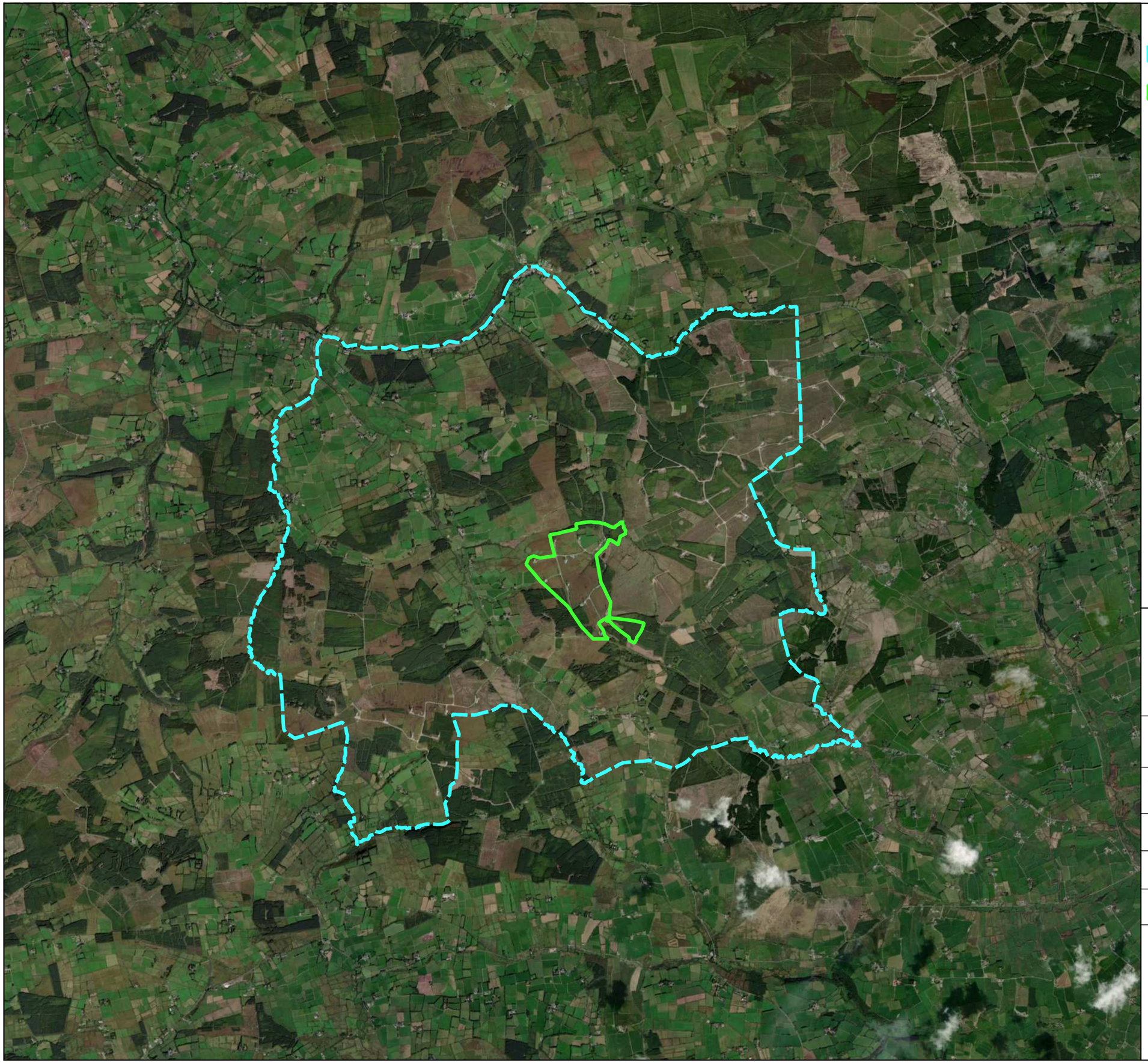
Taurbeg Wind Farm is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork. The Site comprises lands in the townlands of Taurbeg, Glasheenanargid and Taurmore. The Site covers an area of approximately 112 hectares (ha) with a development footprint of approximately 3.37 hectares.

Current land-use within the site is renewable energy production, peat bogs, agricultural pastures, coniferous forestry and transitional woodland scrub. No changes to the current landuse or landcover are proposed for the Site.

Within the wider landscape, land use comprises renewable energy production, agricultural pastures, commercial forestry, transitional woodland scrub and peat bogs.

In order to assess the population in the vicinity of the Site the Proposed Lifetime Extension Population Study Area is defined in terms of the Electoral Divisions (EDs) within which the Site is located. The Proposed Lifetime Extension lies within one ED: Clonfert East as shown in Figure 5-4. Clonfert East will be referred to hereafter as the Proposed Lifetime Extension Population Study Area for this chapter. The Proposed Lifetime Extension Population Study Area has a population of 355 persons, as of 2022 and comprises a total land area of 41km^2 (Source: CSO Census of the Population 2022).

There are 6 Sensitive Receptors located within 1km of the existing turbine locations and 70 within 2km of the existing turbine locations. No sensitive receptors exist within 500m of the existing turbine locations. The closest Sensitive Receptor (H10) is located approximately 731 metres from the nearest turbine location (T8).



Map Legend

- Proposed Lifetime Extension Population Study Area
- EIAR Site Boundary

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Drawing Title
Proposed Lifetime Extension Population Study Area

Project Title
Taurbeg Wind Farm Extension of Operational Life

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5.3.1.2 Proposed Offsetting Measures

Information regarding population and general socio-economic data were sourced from the Central Statistics Office (CSO), the Kerry County Development Plan 2022-2028, Fáilte Ireland and the literature and guidelines as listed in Section 5.1.2 above.

The study included an examination of the population and employment characteristics of the area. This information was sourced from the Census of Ireland 2022, the most recent census for which a complete dataset is available, also the Census of Ireland 2016, the Census of Agriculture 2020 and from the CSO website (www.cso.ie). Census information is divided into State, Provincial, County, Major Town, and Electoral Division (ED) level

The Proposed Offsetting Lands are approximately 8km east of Castleisland, Co. Kerry. Proposed Offsetting Lands measure approximately 123.2ha. Current land use within the Proposed Offsetting Lands include commercial forestry, peat bogs and improved agricultural grassland.

Within the wider landscape, land use comprises of commercial forestry, renewable energy production, agricultural pastures, peat bogs and low density residential.

In order to assess the population in the vicinity of the Site the Proposed Offsetting Measures Population Study Area is defined in terms of the Electoral Divisions (EDs) within which the Site is located. The Proposed Offsetting Lands lie within one ED: Mount Eagle. Mount Eagle will be referred to hereafter as the Proposed Offsetting Measures Population Study Area for this chapter. The Proposed Offsetting Measures Population Study Area has a population of 174 persons, as of 2022 and comprises a total land area of 36.67km^2 (Source: CSO Census of the Population 2022). Please see Figure 5-5 for further details.

Map Legend

- Proposed Offsetting Measures Population Study Area
- Proposed Offsetting Lands

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Drawing Title
Proposed Offsetting Measures Population Study Area

Project Title
Taurbeg Wind Farm Extension of Operational Life

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5.3.2 Population Trends

5.3.2.1 Proposed Lifetime Extension

In the period between the 2016 and the 2022 Census, the population of Ireland increased by 8.1%. During this time, the population of County Cork increased by 7.6%. The data presented in Table 5-1 shows that the population of the Proposed Lifetime Extension Population Study Area decreased by 6.8% between 2016 and 2022. This rate of population growth is significantly lower than that recorded at State level and the County level.

Table 5-1: Population 2016 and 2022 – Proposed Lifetime Extension (Source: CSO)

Area	Population Change		% Population Change
	2016	2022	2016 - 2022
State	4,761,865	5,149,139	8.1%
County Cork	542,868	584,156	7.6%
Proposed Lifetime Extension Population Study Area	381	355	-6.8%

5.3.2.2 Proposed Offsetting Measures

In the period between the 2016 and the 2022 Census, the population of County Kerry increased by 5.9%. The data presented in Table 5-2 shows that the population of the Proposed Offsetting Measures Population Study Area decreased by 1.69% between 2016 and 2022. This rate of population growth is significantly lower than that recorded at State level and the County level

Table 5-2 Population 2016 and 2022 – Proposed Offsetting Measures (Source: CSO)

Area	Population Change		% Population Change
	2016	2022	2016 - 2022
State	4,761,865	5,149,139	8.1%
County Kerry	147,707	156,458	5.9%
Proposed Offsetting Measures Population Study Area	177	174	-1.69%

5.3.3 Population Density

5.3.3.1 Proposed Lifetime Extension

The population densities recorded within the State, County Cork, and the Proposed Lifetime Extension Population Study Area during the 2016 and 2022 Census are shown in Table 5-3.

Table 5-3: Population Density in 2016 and 2022 – Proposed Lifetime Extension (Source: CSO)

Area	Population Density (Persons per square kilometre)	
	2016	2022
State	67.8	73.3
County Cork	72.3	77.8
Proposed Lifetime Extension Population Study Area	9.2	8.6

The population density of the Proposed Lifetime Extension Population Study Area recorded during the 2022 Census was 8.6 persons per square kilometre (km^2). This figure is significantly lower than the national population density of 73.3 persons per km^2 and the Cork County population density of 77.8 persons per $km^{2.}$

5.3.3.2 Proposed Offsetting Measures

The population densities recorded within the State, County Kerry, and the Proposed Offsetting Measures Population Study Area during the 2016 and 2022 Census are shown in Table 5-4.

Table 5-4: Population Density in 2016 and 2022 – Proposed Offsetting Measures (Source: CSO)

Area	Population Density (Persons per square kilometre)	
	2016	2022
State	67.8	73.3
County Kerry	30.73	32.55
Proposed Offsetting Measures Population Study Area	4.83	4.75

The population density of the Proposed Offsetting Measures Population Study Area recorded during the 2022 Census was 4.75 persons per square kilometre (km^2). This figure is significantly lower than the national population density of 73.3 persons per km^2 and the Kerry County population density of 32.55 persons per km^2.

5.3.4 Household Statistics

5.3.4.1 Proposed Lifetime Extension

The number of households and average household size recorded within the State, County Cork, and the Proposed Lifetime Extension Population Study Area during the 2016 and 2022 Censuses are shown in Table 5-5.

Table 5-5: Number of Household and Average Household Size 2016 and 2022 – Proposed Lifetime Extension (Source: CSO)

Area	2016		2022	
	No. of Households	Avg. Size (persons)	No. of Households	Avg. Size (persons)
State	1,702,289	2.75	1,841,152	2.74
County Cork	195,853,	2.83	211,362	2.79
Proposed Lifetime Extension Population Study Area	135	2.72	137	2.61

The figures in Table 5-5 show that the number of households within the State and Proposed Lifetime Extension Population Study Area has increased from 2016 to 2022, while the number of households in County Cork has also increased significantly, with the average size (persons) of the household decreasing by 0.04 persons per household from 2016 to 2022. Average household size recorded within the Proposed Lifetime Extension Population Study Area during the 2022 Census is below both the County and State level. The recorded average household size for the state level saw a slight decrease of 0.1 persons per household for 2022 along with a slight decrease in average size for the Proposed Lifetime Extension Population Study Area.

5.3.4.2 Proposed Offsetting Measures

The number of households and average household size recorded within the State, County Kerry, and the Proposed Offsetting Measures Population Study Area during the 2016 and 2022 Censuses are shown in Table 5-6.

Table 5-6: Number of Household and Average Household Size 2016 and 2022 – Proposed Lifetime Extension (Source: CSO)

Area	2016		2022	
	No. of Households	Avg. Size (persons)	No. of Households	Avg. Size (persons)
State	1,702,289	2.75	1,841,152	2.74
County Kerry	195,853,	2.60	211,362	2.57
Proposed Offsetting Measures Population Study Area	135	2.72	137	2.64

The figures in Table 5-6 show that the number of households within the State and Population Study Area has increased from 2016 to 2022, while the number of households in County Kerry has also increased significantly. The average size (persons) within households decreased by 0.03 persons from 2016 to 2022. Average household size recorded within the Proposed Offsetting Measures Population Study Area during the 2022 Census is below the State level, but not county level. The recorded average household size for the state level saw a slight decrease of 0.01 persons per household for 2022, with a significant decrease of 0.08 persons per household within the Proposed Offsetting Measures Population Study Area.

5.3.5 Age Structure

5.3.5.1 Proposed Lifetime Extension

Table 5-7 presents the population percentages of the State, County Cork, and the Proposed Lifetime Extension Population Study Area within different age groups as defined by the Central Statistics Office during the 2022 Census. This data is also displayed in Figure 5-6.

Table 5-7: Population per Age Category in 2022 – Proposed Lifetime Extension (Source: CSO)

Area	Age Category				
	0 - 14	15 – 24	25 - 44	45 - 64	65 +
State	19.7%	12.5%	27.6%	25.1%	15.1%
County Cork	19.5%	12.6%	27.2%	25.5%	15.3%
Proposed Lifetime Extension Population Study Area	18.3%	8.7%	21.1%	26.8%	25.1%

The age structure reported in the Proposed Lifetime Extension Study Area is broadly similar to those recorded at State and county level for most categories. However, the Proposed Lifetime Extension Study Area reported a greater proportion of the population within the 65+ age category when compared to the State and County. The age range 15-24 age category has a lower percentage in the Proposed Lifetime Extension Study Area when compared with County and State level., The highest population percentage in the Proposed Lifetime Extension Study Area occurs within the 45-64 age category, whereas the State and County's highest population percentage occurs within the 25-44 age category.

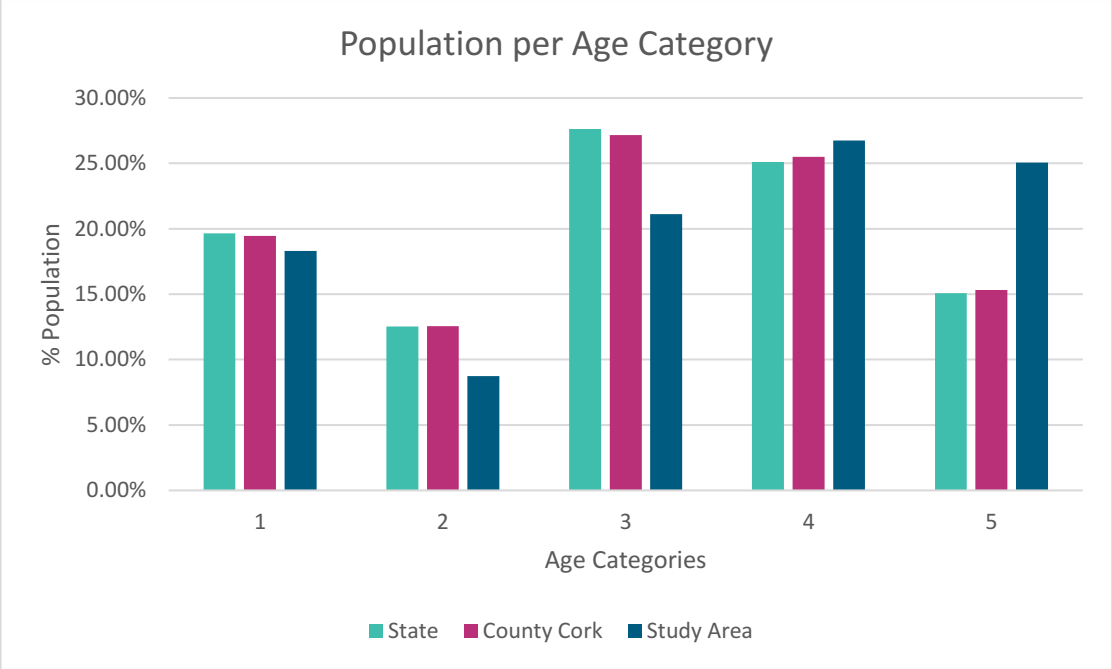

Figure 5-6: Population per Age Category in 2022 – Proposed Lifetime Extension (Source: CSO)

5.3.5.2 Proposed Offsetting Measures

Table 5-8 presents the population percentages of the State, County Cork, and the Proposed Offsetting Measures Population Study Area within different age groups as defined by the Central Statistics Office during the 2022 Census. This data is also displayed in Figure 5-7.

Table 5-8: Population per Age Category in 2022 – Proposed Offsetting Measures (Source: CSO)

Area	Age Category				
	0 - 14	15 – 24	25 - 44	45 - 64	65 +
State	19.7%	12.5%	27.6%	25.1%	15.1%
County Cork	19.5%	12.6%	27.2%	25.5%	15.3%
Proposed Offsetting Measures Population Study Area	18.3%	8.7%	21.1%	26.8%	25.1%

The age structure reported in the Proposed Offsetting Measures Population Study Area is broadly similar to those recorded at State and county level for most categories. However, the Proposed Offsetting Measures Population Study Area reported a much greater proportion of the population within the 65+ age category when compared to the State and County. The age range 25-44 age category has a lower percentage in the Proposed Offsetting Measures Population Study Area when compared with County and State level., The highest population percentage in the Similar to the County statistics, the Proposed Offsetting Measures Population Study Area occurs within the 45-64 age category, whereas the States highest population percentage occurs within the 25-44 age category.

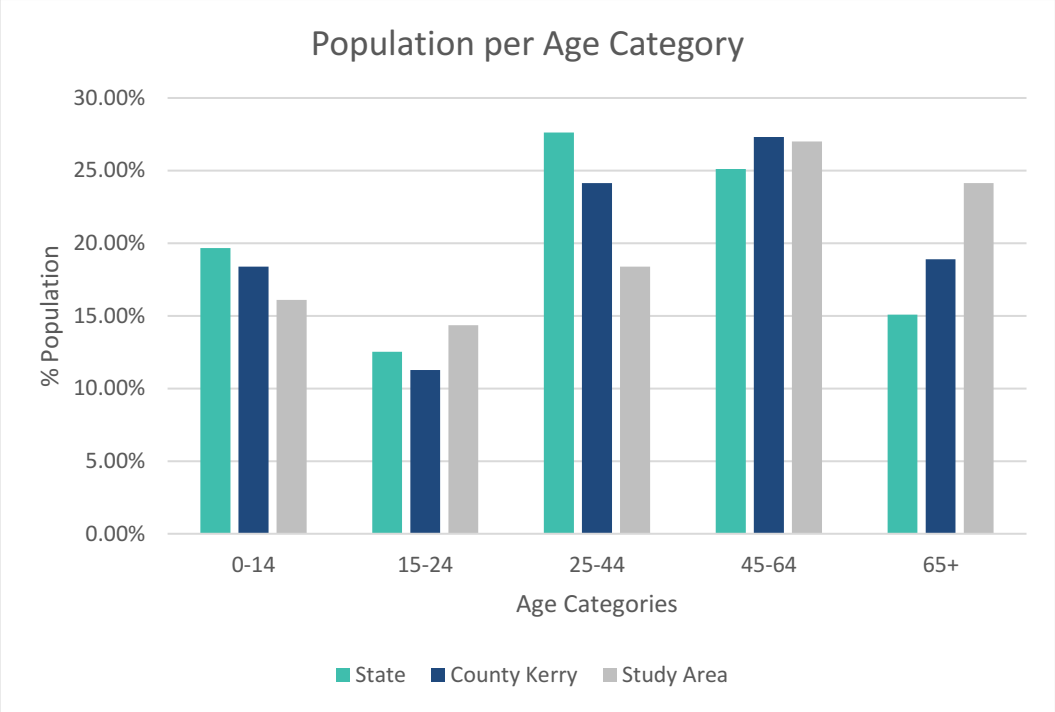

Figure 5-7: Population per Age Category in 2022 – Proposed Offsetting Measures (Source: CSO)

5.3.6 Employment and Economic Activity

5.3.6.1 Proposed Lifetime Extension

The labour force consists of those who can work, i.e., those who are aged 15+, out of full-time education and not performing duties that prevent them from working. In 2022, there were 2,531,099 persons in the labour force in the State. Table 5-9 shows the percentage of the total population aged 15+ who were in the labour force during the 2022 Census. This figure is further broken down into the percentages that were at work or unemployed. It also shows the percentage of the total population aged 15+ who were not in the labour force, i.e., those who were students, retired, unable to work or performing home duties. In Census 2022, for the first time ever, two categories of unemployment detail were included, Long-term Unemployment and Short-term Unemployment, for the purpose of this assessment, both categories have been grouped into one Unemployment group.

Table 5-9: Economic Status of the Total Population Aged 15+ in 2022 – Proposed Lifetime Extension (Source: CSO)

Status		State	County Cork	Proposed Lifetime Extension Population Study Area
% of population aged 15+ who are in the labour force		**61.2%**	**60.5%**	**52.8%**
% of which are:	At work	91.7%	93.9%	94.1%
	Looking	1.4%	1.0%	0%
	Unemployed	6.9%	5.1%	6%
% of population aged 15+ who are not in the labour force		**38.8%**	**39.7%**	**47.2%**

Status		State	County Cork	Proposed Lifetime Extension Population Study Area
% of which are:	Student	28.6%	29.1%	18.2%
	Home duties	17%	17.4%	21.2%
	Retired	41%	39.6%	48.2%
	Unable to work	11.8%	12.3%	10.9%
	Other	1.7%	1.7%	1.5%

Overall, the principal economic status of those living in the Proposed Lifetime Extension Population Study Area is lower than that recorded at State level. During the 2022 Census, the percentage of people over the age of 15 who were in the labour force was similar at both County and State level at just over 60%. However, within the Proposed Lifetime Extension Population Study Area, numbers were lower, with 52.8% of people over the age of 15 in the labour force. Of those who were not in the labour force during the 2022 Census, the highest percentage of the Proposed Lifetime Extension Population Study Area population were 'Retired' individuals, similar to state and county populations.

The CSO employment figures grouped by socio-economic status includes the entire population for the Study Area, County and State in their respective categories. As such, the socio-economic category of 'Other' is skewed to include those who are not in the labour.

5.3.6.2 Proposed Offsetting Measures

Table 5-10 shows the percentage of the total population aged 15+ who were in the labour force during the 2022 Census. This figure is further broken down into the percentages that were at work or unemployed. It also shows the percentage of the total population aged 15+ who were not in the labour force, i.e., those who were students, retired, unable to work or performing home duties. In Census 2022, for the first time ever, two categories of unemployment detail were included, Long-term Unemployment and Short-term Unemployment, for the purpose of this assessment, both categories have been grouped into one Unemployment group.

Table 5-10: Economic Status of the Total Population Aged 15+ in 2022 – Proposed Offsetting Measures (Source: CSO)

Status		State	County Kerry	Proposed Offsetting Measures Population Study Area
% of population aged 15+ who are in the labour force		**61.2%**	**58.1%**	**50.7%**
% of which are:	At work	91.7%	91.0%	90.5%
	Looking	1.4%	1.5%	0%
	Unemployed	6.9%	7.5%	9.5%
% of population aged 15+ who are not in the labour force		**38.8%**	**41.9%**	**49.3%**

Status		State	County Kerry	Proposed Offsetting Measures Population Study Area
% of which are:	Student	28.6%	23.3%	22.2%
	Home duties	17%	16.5%	15.3%
	Retired	41%	46.2%	50.0%
	Unable to work	11.8%	12.1%	12.5%
	Other	1.7%	1.8%	0.0%

Overall, the principal economic status of those living in the Proposed Offsetting Measures Population Study Area is lower than that recorded at State level. During the 2022 Census, the percentage of people over the age of 15 who were in the labour force was similar at both County and State level. However, within the Proposed Offsetting Measures Population Study Area, numbers were significantly lower, with 50.7% of people over the age of 15 in the labour force. Of those who were not in the labour force during the 2022 Census, the highest percentage of the Proposed Offsetting Measures Population Study Area population were 'Retired' individuals, similar to state and county populations.

The CSO employment figures grouped by socio-economic status includes the entire population for the Study Area, County and State in their respective categories. As such, the socio-economic category of 'Other' is skewed to include those who are not in the labour force.

5.3.6.3 Employment and Investment Potential in the Irish Wind Energy Industry

Background

A report entitled '*Jobs and Investment in Irish Wind Energy – Powering Ireland's Economy*' was published in 2009 by Deloitte, in conjunction with the Irish Wind Energy Association (IWEA). This report focused on the ability of the Irish wind energy industry to create investment and jobs. In terms of the overall economic benefit to be obtained from wind energy, the report states in its introduction:

> *"Ireland is fortunate to enjoy one of the best wind resources in the world. Developing this resource will reduce and stabilise energy prices in Ireland and boost our long-term competitiveness as an economy. It will also significantly reduce our dependence on imported fossil fuels."*

More recently, a report published in 2014 by Siemens entitled '*An Enterprising Wind - An economic analysis of the job creation potential of the wind sector in Ireland*', also in conjunction with the Irish Wind Energy Association (IWEA), concluded that, *'a major programme of investment in wind could have a sizeable positive effect on the labour market, resulting in substantial growth in employment.'* The report considers the three potential types of direct employment created, as a result of increased investment in wind energy, to be:

- Wind Energy Industry Employment:
- Installation
- Development
- Planning
- Operation and Maintenance
- Investor activity

- Electricity Grid Network Employment
- Potential Wind Turbine Manufacturing Employment

The Sustainable Energy Authority of Ireland[9] demonstrates in their '*Wind Energy Roadmap 2011-2050*', that '*the wind energy resource represents a significant value to Ireland by 2050. This value is presented in terms of its ability to contribute to our indigenous energy needs, the benefits of enhanced employment creation and investment potential, and the ability to significantly abate carbon emissions to 2050.*'

Employment Potential

The 2014 report *"An Enterprising Wind: An economic analysis of the job creation potential of the wind sector in Ireland"* published by the Irish Wind Energy Association (IWEA) predicted that the wind energy sector in Ireland would result in 6,659 direct jobs in a scenario where 4GW capacity is achieved by 2020. This figure of 6,659 is broken down further; 5,596 of these jobs are associated directly with the construction and installation of windfarms, while the remaining 1,063 jobs are associated with the national grid. Under this scenario this contributes 1.66 direct jobs per Megawatt (MW) of wind capacity throughout the various stages of installation. According to Wind Energy Ireland, the installed wind capacity in Ireland is over 4.3GW as of February 2021, which would support employment during the last decade. Ireland needs to achieve a total of 9GW of onshore wind by 2030 which will further support further employment.

The Sustainable Energy Authority of Ireland[10] estimates, in their '*Wind Energy Roadmap 2011-2050*', note that '*Onshore and offshore wind could create 20,000 direct installation and O&M jobs by 2040'.* Furthermore, '*wind energy resource represents a significant value to Ireland by 2050. This value is presented in terms of its ability to contribute to our indigenous energy needs, the benefits of enhanced employment creation and investment potential, and the ability to significantly abate carbon emissions to 2050'.*

The 2014 report '*The Value of Wind Energy to Ireland*', published by Pőyry, stated that growth of the wind sector in Ireland could support 23,850 jobs (construction and operational phases) by 2030. The report states that if Ireland instead chooses to not develop any more wind, then by 2030 the country will be reliant on natural gas for most of our electricity generation, at a cost of €671 million per annum in fuel import costs.

Internationally, a report issued by WindEurope in September 2017, entitled '*Wind energy in Europe: Scenarios for 2030'* details various scenarios in Europe in respect to the EU target for renewable energy. According to WindEurope's High Scenario, which assumes favourable market and policy conditions including the achievement of a 35% EU renewable energy target (slightly higher than the 32% EU target for renewables), '*397 GW of wind energy capacity would be installed in the EU by 2030, 298.5 GW onshore and 99 GW offshore. In this scenario, the wind energy industry would invest €351bn by 2030, and it would create 716,000 jobs'.*

A report published by MaREI, the SFI Research Centre for Energy, Climate and Marine, hosted by University College Cork[11] (March 2021) details that in order to meet the government target of net-zero carbon emissions by 2050, at least 25,000 jobs will be created in the development of onshore and offshore wind to meet our zero carbon targets.

A report issued by WindEurope in February 2022, titled '*Wind Energy in Europe: 2021 Statistics and the Outlook for 2022-2026'* details various scenarios in Europe in respect to the EU target for renewable energy. According to WindEurope's report, '*Europe installed 17GW (11 GW in the EU-27) of new wind*

[9] *SEAI (2019), https://www.seai.ie/publications/Wind_Energy_Roadmap_2011-2050.pdf*
[10] *SEAI (2019), https://www.seai.ie/publications/Wind_Energy_Roadmap_2011-2050.pdf*
[11] *https://www.marei.ie/our-climate-neutral-future-zeroby50/*

capacity in 2021. This is not even half of what the EU should be building to be on track to deliver its 2030 Climate Energy Goals.' The report continued on to state that '*We expect Europe to install 116 GW of new wind farms over the period from 2022-2026. Three quarters of these new capacity additions will be onshore wind.*' The report also states that '*The European Commission modelling shows that we need at least 79 GW offshore wind but National Government have pledged to build at least 92 GW offshore wind capacity by 2030.'*

As of April 2024, there were 6,095 Megawatts (MW) of wind energy capacity installed on the island of Ireland[12]. Of this, 4,730 MW was installed in the Republic of Ireland. The majority of the Republic of Ireland's installed wind energy capacity is located in Counties Donegal, Galway, Cork, Clare and Kerry, contributing to employment potential on the Island of Ireland.

Economic Value

A 2019 report by Baringa, '*Wind for a Euro: Cost-benefit analysis of wind energy in Ireland 2000-2020*', has analysed the financial impact for end consumers of the deployment of wind generation in Ireland over the period 2000-2020. The report calculates how the costs and benefits for consumers would have differed if no wind farms had been built. The analysis indicated that the deployment of 4.1 GW of wind generation capacity in Ireland between 2000 and 2020 (2018-2020 results being projective) will result in a total net cost to consumers, over 20 years, of €0.1bn (€63 million to be exact), which equates to a cost of less than €1 per person per year since 2000. Further cost benefit analysis noted that wind energy has delivered €2.3 billion in savings in the wholesale electricity market. As such, the economic benefit of renewable energy to consumers is greater than what would have been if Ireland did not invest in wind power. This corresponds with the Deloitte report which indicates that more wind energy feeding into the national grid will result in lower and more stable energy costs for consumers.

Furthermore, in May 2020, IWEA released its 70by30 Implementation Plan Reports which further details the savings that can be made from the continuation of onshore wind. The report, entitled '*Saving Money - 70 by 30 Implementation Plan'*, notes that '*Baringa calculated previously that if onshore wind in Ireland can be delivered at €60/MWh, on average, between 2020 and 2030, then the 70 per cent renewable electricity target set out in the Climate Action Plan will actually be cost neutral for the consumer. If we can achieve prices under €60/MWh then Ireland's electricity consumers will be saving money'.*

The Proposed Lifetime Extension will, if consent is granted, continue to contribute to the economic value that renewable energy brings to the country.

5.3.7 Land-Use Patterns and Activities

5.3.7.1 Proposed Lifetime Extension

The existing Taurbeg Wind Farm has been operational since March 2006.The primary surrounding land use within the study area is wind energy, agricultural and private forestry. The total area of farmland within the Proposed Lifetime Extension Study Area measures approximately 1,413 hectares, equating to approximately 34% of total area, according to the CSO Census of Agriculture 2020. There are 47 agricultural holdings within the Proposed Lifetime Extension Study Area, with an average farm size of 30.1 hectares. Table 5-11 shows the breakdown of farmed lands within the Study Area.

[12] *Eirgrid, https://www.eirgrid.ie/grid/system-and-renewable-data-reports*

Table 5-11: Farm Size and Classification within the Proposed Lifetime Extension Study Area in 2020 – Proposed Lifetime Extension (Source: CSO)

DED	No of holdings	Average size (hectares)	Median age of holder	Livestock units
Clonfert East	47	30.1	53	1172
Size of ED			4100 hectares	
Total Area Farmed within ED			1413 hectares	
Farmland as % of EDs			34.46%	

In a wider context, Taurbeg Wind Farm is located in an area where wind energy is one of the main land uses, alongside commercial forestry and agriculture. The closest operational wind farm to Taurbeg is Knockacummer Wind Farm, located at a distance of approximately 882m between the wind farm's closest turbine. A list of operational wind farms located within 20km of the existing Taurbeg Wind Farm site is included in Section 2.8.3 of Chapter 2 of this EIAR.

5.3.7.2 Proposed Offsetting Measures

The Proposed Offsetting Lands are located in an area that primarily consists of commercial forestry. The primary surrounding land use within the Proposed Offsetting Measures Population Study Area is wind energy, agricultural and private forestry. The total area of farmland within the Proposed Offsetting Measures Population Study Area measures approximately 1,129 hectares, equating to approximately 31% of total area, according to the CSO Census of Agriculture 2020. There are 57 agricultural holdings within the Proposed Offsetting Measures Population Study Area, with an average farm size of 30.5 hectares. Table 5-12 shows the breakdown of farmed lands within the Proposed Offsetting Measures Study Area.

Table 5-12: Farm Size and Classification within the Proposed Offsetting Measures Population Study Area in 2020 – Proposed Offsetting Measures(Source: CSO)

DED	No of holdings	Average size (hectares)	Median age of holder	Livestock units
Mount Eagle	37	30.5	57	1011
Size of ED			3,667 hectares	
Total Area Farmed within ED			1,129 hectares	
Farmland as % of EDs			30.78%	

5.3.7.3 Services

5.3.7.3.1 *Proposed Lifetime Extension*

The main services for the Proposed Lifetime Extension Population Study Area are located within Rockchapel village, located approximately 4km north of the existing Taurbeg Wind Farm. Other settlement centres in the wider region which provide retail, recreational, educational, and religious services include the town of Newmarket, the village of Brosnagh and the village of Ballydesmond, located approximately 9.3km southeast, 10.8km northwest and 10.1km southwest of the existing Taurbeg Wind Farm, respectively.

5.3.7.3.2 *Proposed Offsetting Measures*

The main services for the Proposed Offsetting Measures Population Study Area are located in the Town of Castleisland, ~8km west of the Proposed Offsetting Lands, and the village of Ballydesmond, ~7.2km southeast of the Proposed Offsetting Lands. Other settlement centres in the wider region which provide retail, recreational, educational, and religious services include the village of Scartaglan and Rockchapel, 7.5km southwest and 12.7km northeast of the Proposed Offsetting Lands.

5.3.7.3.3 *Education*

Proposed Lifetime Extension

The nearest Primary school is the Rockchapel National School, located approximately 4.8km north of the existing Taurbeg Wind Farm.

The closest secondary school is the Presentation Secondary School, Casteleisland, Co. Kerry situated approximately 30km west of the existing Taurbeg Wind Farm at its closest point. There are no nearby third level education institutes in this area.

Proposed Offsetting Measures

The nearest primary school is Kilmurry National School, approximately 3km from the Proposed Offsetting Lands. Two national schools are also located in Castleisland ~8km from the Proposed Offsetting Lands. There are three secondary schools similarly located in Castleisland, namely, Saint Patricks Secondary School, Presentation Secondary School and Castleisland Community College.

5.3.7.3.4 *Access and Public Transport*

Proposed Lifetime Extension

The existing Taurbeg Wind Farm is accessed via the wind farm site entrance off the L5005 local road, in the townland of Taurbeg and is served by a network of existing wind farm access roads.

The Taurbeg Wind Farm site is not accessible via public transport. The nearest bus stop is approximately 11km to the southeast in the town of Newmarket and is serviced by Bus Eireann Route 243.

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The Proposed Offsetting Lands are not serviced by any public transport routes, however, can be accessed via the L-10720 and L-10750 local roads.

5.3.7.3.5 *Amenities and Community Facilities*

Proposed Lifetime Extension

There are a number of amenities and community facilities, including sports clubs, youth clubs, recreational areas, retail and personal services located in the nearby villages of Rockchapel and Meelin, and Newmarket, Brosnagh and Ballydesmond. The towns of Kishkeem and Boherboy also offer a large selection of amenities and community facilities.

The varied environment of this area of County Cork provides many opportunities for outdoor activities.

Proposed Offsetting Measures

The nearby town of Castleisland provides a variety of community facilities and amenities, including multiple athletic and music clubs, many opportunities for outdoor activities such as hillwalking and cycyling, as well as tourist attractions such as the Crag Caves. On a wider scale, the county of Kerry is well known for its natural beauty and large variety of outdoor activities.

5.3.8 Tourism and Amenity

5.3.8.1 Overseas Tourism Numbers and Revenue

Tourism is one of the major contributors to the national economy and is a significant source of full time and seasonal employment. *Key Tourism Facts 2019*, pertaining to domestic and international tourism volumes for Ireland, was published by Failte Ireland in 2021 for the year 2019. *Key Tourism Facts 2019* states that during 2019, overseas tourists to Ireland grew by 0.7% to 9.7 million. In 2019, out-of-state (Overseas and Northern Ireland) tourist expenditure amounted to €5.6 billion. With a further €1.8 billion spent by overseas visitors on fares to Irish carriers, foreign exchange earnings were €7.4 billion. Domestic tourism expenditure amounted to €2.1 billion, making tourism a €9.5 billion industry. The Central Statistics Office's official count of direct employment in 'Accommodation and food service activities', a category which includes hotels, restaurants, bars, canteens and catering, was 177,700 in Q3 2019 (7.6% of total employment) and rises to 260,000 when including seasonal and casual employment in the industry.

Key Tourism Facts 2022, published in October 2023 does not provide the same level of detail in terms of tourist numbers and expenditure as the 2019 version of the same report, however it does note that

> *"While traditional tourism statistics focus primarily on 'flows' (i.e., the number of visitors, the number of overnight stays, etc.), Gross Value Added (GVA) measures the overall contribution of a particular sector to national income. Tourism activity in Ireland is associated with over 4% of direct GVA."*

Key Tourism Facts 2022 goes on to state that through an alternative method of estimating employment using PAYE tax data, the CSO estimates the number of people employed in 'Tourism Industries' to be 220,000 in Q3 2022.

The Republic of Ireland is divided into seven tourism regions. Table 5-13 shows the total revenue and breakdown of overseas tourist numbers to each region in Ireland during 2019 ('*Key Tourism Facts 2019*, Fáilte Ireland, March 2021).

Table 5-13: Overseas Tourists Revenue and Numbers 2019 (Source: Fáilte Ireland)

Region	Total Revenue (€m)	Total Number of Overseas Tourists (000s)
Dublin	€2,210m	6,644

Region	Total Revenue (€m)	Total Number of Overseas Tourists (000s)
Mid-East/Midlands	€348m	954
South-East	€261m	945
South-West	**€970m**	**2,335**
Mid-West	€472m	1,432
West	€653m	1,943
Border	€259m	768
Total	**€5,173 m**	**15,021**

The existing Taurbeg Wind Farm and Proposed Offsetting Lands are located within the South-West Region. According to '*Regional Tourism Performance in 2019'* (Fáilte Ireland, March 2021), the South-West Region which comprises the counties of Cork and Kerry, benefitted from approximately 15.5% of the overseas tourists to the country and approximately 19% of the associated tourism income generated in Ireland in 2019.

Although the data for 2019 is not available, Table 5-14 presents the most recent breakdown of overseas tourist numbers and revenue to the South-West region during 2017 ('*2017 Topline Tourism Performance by Region,* Fáilte Ireland, August 2018). As can be observed in Table 5-14, County Cork had the highest number of overseas tourists visiting the Region during 2017 and had a tourism revenue at €631m.

Table 5-14 presents the county-by-county breakdown of overseas tourist numbers and revenue to the South-West Region during 2017 ('*2017 Topline Tourism Performance By Region, Fáilte Ireland, August 2018*)[13]. There is no published County by County tourism breakdown for 2018 to 2023 to date). As can be observed, County Cork had a tourism revenue of at €833 million, and Kerry €337 million.

Table 5-14: Overseas Tourism to Border Region during 2017 (Source: Fáilte Ireland)

County	Total Revenue (€m)	No. of Overseas Tourists (000s)
Cork	631	1605
Kerry	337	1277

5.3.8.2 Domestic Tourism and Revenue

Fáilte Irelands latest key tourism performance data was released in October 2023, which provides Domestic Tourism and Revenue data for 2022 (*Key Tourism Facts 2022*, Failte Ireland, 2023). During 2022, total domestic expenditure was approximately €2,930 million, an increase from €2,146.6 million in 209 and €2,006 million in 2018.

[13] *2017 Topline Tourism Performance By Region, Fáilte Ireland, August 2018 Available at:* https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/2_Regional_SurveysReports/2017-topline-regional-performance-(003).pdf?ext=.pdf

Table 5-15 shows the total estimated expenditure and breakdown of domestic tourist trips numbers to each of Irelands seven tourist regions during 2022.

Table 5-15: Domestic Tourism Expenditure and Number of Trips 2022 (Source Fáilte Ireland)

Region	Estimated Expenditure (€m)	Total No. Trips (000s)
Dublin	€419	1,861
Mid-East/Midlands	€395	1,957
South-East	€381	1,899
South-West	**€665**	**2,763**
Mid-West	€261	1,322
West	€459	1,866
Border	€350	1,606
Total	**€2,930**	**13,274**

The existing Taurbeg Wind Farm and Propsoed Offsetting Measures Lands are located within South-West Tourism Region. The South-West Region, benefitted from approximately 20.8% of total domestic trips and 22.7% of associated estimated expenditure in Ireland in 2022.

5.3.8.3 Tourism Attractions

5.3.8.3.1 *Proposed Lifetime Extension*

There are no identified tourist attractions within or adjacent to the existing Taurbeg Wind Farm.

Tourism Attractions within the surrounding landscape

The varied natural landscape and scenic amenity of this area provide many opportunities for general outdoor recreation within the wider area including cycling, golfing and walking. The following walking and cycling routes are located nearby:

- The Duhallow Trail Cycle Route
- The Duhallow Walking Trail
- Mullaghareirk – Banane Loop Walk
- Mullaghareirk – Rowls – Lanford Loop Walk

County Cork has a wide range of nationally significant tourism assets which include the following:

- Blarney Castle and Gardens – A medieval castle dating back to 1446. The Blarney Stone is believed to have special powers and is located on the grounds.
- Saint Georges Arts and Heritage Centre- a premier performing arts venue for a wide range of arts, cultural heritage and tourism.
- Nano Nagle Place- A restored walled convent featuring gardens and beautiful architecture and landscape.
- Annes Grove Gardens- a horticultural paradise in North Cork.
- Kanturk Castle- a 17th Century castle with adjoining 'Old Court' which was built by the MacDonagh MacCarthys, Lords of Duhallow.

- Fota Wildlife Park - AWildlife park stretching 100 acres on the scenic Fota Island. Features an Asian Sanctuary, kids play areas and picnic areas.
- Spike Island- Former world's largest prison in the 1850s, located on an island off the coast of Cobh.

Archaeological sites and monuments are part of Irish national heritage and are recognised tourist attractions across the country. National Monuments within 10km of the nearest turbine are listed below. Please see Chapter 14 Archaeological, Architectural and Cultural Heritage for further details. It should be noted that not all of these National Monuments are publicly accessible.

- Souterrain- underground chamber with hachured circular enclosure ringfort also nearby. Located 1.5km from T3
- Massrock- Natural Hillock, known as 'little hill of the prayers" located 860m from T7
- Kiln lime- early/mid century lime kiln located 880m from T8
- Burial Ground- burial ground with dead buried here following a battle. Located 706m from T10
- Enclosure- possible penannular enclosure located 590m from T10

5.3.8.3.2 *Proposed Offsetting Measures*

There are no identified tourist attractions within or adjacent to the Proposed Offsetting Lands.

Tourism Attractions within the surrounding landscape

There are a number of walking and cycling trails nearby, including:

- Castleisland River Loop Walk
- Glanageenty, Brother Bernards Loop
- The Ring of Kerry Cycle Route
- Torc Mountain Loop

County Kerry has a wide range of nationally significant tourism assets which include the following:

- Killarney National Park & Torc Waterfall
- Ring of Kerry
- Muckross House, Gardens & Traditional Farms
- Skellig Michael
- Killarney Falconry

Archaeological sites and monuments are part of Irish national heritage and are recognised tourist attractions across the country. Whilst there are no archaeological features within the Proposed Offsetting Lands, there are some within close proximity to these lands. Please see Chapter 14 Archaeological, Architectural and Cultural Heritage for further details. It should be noted that not all of these National Monuments are publicly accessible. National monuments within 2km of these lands include:

- 3 no. Fulacht Fia
- 4 no Ringforts – Raths
- 3 no. Enclosures
- 2 no. Hut Sites
- A children's burial ground
- A burnt spread

5.3.8.4 Tourist Attitudes to Wind Farms

5.3.8.4.1 *Scottish Tourism Survey 2021*

BiGGAR Economics undertook an independent study in 2021, entitled 'Wind Farms & Tourism Trends in Scotland: Evidence from 44 Wind Farms' to understand the relationship, if any, that exists between the development of onshore wind and the sustainable tourism sector in Scotland. In recent years, the onshore wind sector and sustainable tourism sector have grown significantly in Scotland. However, it could be argued that if there was any relationship between the growth of onshore wind energy and tourism, it would be at a more local level. This study therefore considered the evidence at a local authority level and in the immediate vicinity of constructed wind farms.

Since 2009, the onshore wind sector has expanded considerably in Scotland. Employment in tourism related sectors in Scotland also grew during the years since 2009, an overall increase of 20%. Analysis of the rates of change in the number of onshore wind turbines and in tourism-related employment in local authority areas, found that there is no correlation between the two factors. This applies to whether the analysis covers the decade between 2009 – 2019, or the more recent 2015 to 2019 period.

The research also analysed trends in tourism employment within the immediate vicinity of wind farm developments. This included 16 no. wind farms with a capacity of at least 10MW that became operational between 2015 and 2019. Analysis of trends in tourism employment in the locality of these wind farms (study areas were based on a 15km radius) found that 11 of these 16 areas had experienced more growth in tourism employment than for Scotland as a whole. For 12 of the 16 wind farms, trends in tourism employment in the locality had outperformed the local authority area in which they were based.

The research also re-examined 28 wind farms constructed between 2009 and 2015 that had been analysed in a previous study published in 2017, finding that the localities in which they were based had outperformed Scotland and their local authority areas in the majority of cases. Moreover, the analysis, found that in the seven areas which had underperformed their local authority areas in the 2017 study, four had done better than their local authorities in the 2015 to 2019 period.

This research analysed trends in tourism employment in the localities of 44 no. wind farms developed in recent years, providing a substantial evidence base. The study found no relationship between tourism employment and wind farm development, at the level of the Scottish economy, across local authority areas, not in the locality of the wind farm sites.

5.3.8.4.2 *Fáilte Ireland Surveys 2007 and 2012*

In 2007, Fáilte Ireland in association with the Northern Ireland Tourist Board carried out a survey of domestic and overseas holidaymakers to Ireland in order to determine their attitudes to wind farms. The purpose of the survey was to assess whether the development of wind farms impacts on the enjoyment of the Irish scenery by holidaymakers. The survey involved face-to-face interviews with 1,300 tourists (25% domestic and 75% overseas). The results of the survey are presented in the Fáilte Ireland Newsletter 2008/No.3 entitled 'Visitor Attitudes on the Environment: Wind Farms'.

The Fáilte Ireland survey results indicate that most visitors are broadly positive towards the idea of building wind farms in Ireland. There exists a sizeable minority (one in seven) however who are negative towards wind farms in any context. In terms of awareness of wind farms, the findings of the survey include the following:

- Almost half of those surveyed had seen at least one wind farm on their holiday to Ireland. Of these, two thirds had seen up to two wind farms during their holiday.
- Typically, wind farms are encountered in the landscape while driving or being driven (74%), while few have experienced a wind farm up close.

- Of the wind farms viewed, most contained less than ten turbines and 15% had less than five turbines.

Regarding the perceived impact of wind farms on sightseeing, the Fáilte Ireland report states:

> *"Despite the fact that almost half of the tourists interviewed had seen at least one wind farm on their holiday, most felt that their presence did not detract from the quality of their sightseeing, with the largest proportion (45%) saying that the presence of the wind farm had a positive impact on their enjoyment of sightseeing, with 15% claiming that they had a negative impact."*

In assessing the perceived impact of wind farms on beauty, visitors were asked to rate the beauty of five different landscape types: Coastal, Mountain, Farmland, Bogland and Urban Industrial, and then rate on a scale of 1-5 the potential impact of a wind farm being sited in each landscape. The survey found that each potential wind farm must be assessed on its own merits. Overall however, in looking at wind farm developments in different landscape types, the numbers claiming a positive impact on the landscape due to wind farms were greater than those claiming a negative impact, in all cases.

Regarding the perceived impact of wind farms on future visits to the area, the Fáilte Ireland survey states:

> *"Almost three quarters of respondents claim that potentially greater numbers of wind farms would either have no impact on their likelihood to visit or have a strong or fairly strong positive impact on future visits to the island of Ireland. Of those who feel that a potentially greater number of wind farms would positively impact on their likelihood to visit, the key driver is their support for renewable energy and potential decreased carbon emissions."*

The report goes on to state that while there is a generally positive disposition among tourists towards wind development in Ireland, it is important also to take account of the views of the one in seven tourists who are negatively disposed towards wind farms. This requires good planning on the part of the wind farm developer as well as the Local Authority. Good planning has been an integral component of the Proposed Lifetime Extension throughout the assessment processes. Reference has been made to the '*Planning Guidelines on Wind Energy Development 2006'* and the '*Draft Revised Wind Energy Development Guidelines December 2019'* in addition to WEI (previously IWEA) best practice guidance, throughout all stages, including pre-planning consultation and scoping.

The 2007 survey findings are further upheld by a more recent report carried out by Fáilte Ireland on tourism attitudes to wind farms in 2012. The results of the updated study were published in the 'Fáilte Ireland Newsletter 2012/No.1 entitled 'Visitor Attitudes on the Environment: Wind Farms – Update on 2007 Research'. The updated survey found that of 1,000 domestic and foreign tourists who holidayed in Ireland during 2012, over half of tourists said that they had seen a wind turbine while travelling around the country. Of this number of tourists, 21% claimed wind turbines had a negative impact on the landscape. However, 32% said that it enhanced the surrounding landscape, while 47% said that it made no difference to the landscape. Almost three quarters of respondents claim that potentially greater numbers of wind farms would either have no impact on their likelihood to visit or have a strong or fairly strong positive impact on future visits to the island of Ireland.

Further details regarding the general public perception of wind energy, including those living in the vicinity of a wind farm, are presented in Section 5.3.11

5.3.9 Public Perception of Wind Energy

5.3.9.1 Sustainable Energy Authority of Ireland Survey 2017 and 2003

5.3.9.1.1 Background

The results of a national survey entitled 'Attitudes Towards the Development of Wind Farms in Ireland'[14] were published by the Sustainable Energy Authority of Ireland (SEAI) in 2003. A catchment area survey was also carried out by SEAI (formerly SEI) in order to focus specifically on people living with a wind farm in their locality or in areas where wind farms are planned. An updated survey was carried out in 2017 to update findings of the survey.

5.3.9.1.2 *Findings- 2017 Survey*

A survey carried out by Interactions in October 2017 published by the SEAI, show 47% of Irish adults polled are strongly in favour of wind power in Ireland while a further 38% favour it. Overall, this is a 4% increase in favourable attitudes towards wind power compared with similar research in 2013.

The SEAI survey found that the overall attitude to wind farms is very positive, with 84% of respondents in favour of the use of wind energy in Ireland. Approximately two thirds of respondents (70%) would prefer to power their home with renewable energy over fossil fuels, and 45% would be in favour of a wind farm development in their area.

The survey also captured the perceived benefits of wind power among the public. Of those surveyed three quarters selected 'good for the environment' and 'reduced Carbon Dioxide emissions' whilst just over two in three cited cheaper electricity.

The original 2003 SEAI survey found that the overall attitude to wind farms is very positive, with 84% of respondents rating it positively or very positively. One percent rates it negatively and 14% had no opinion either way. Approximately two thirds of respondents (67%) were found to be positively disposed to having a wind farm in their locality. Where negative attitudes were voiced towards wind farms, the visual impact of the turbines on the landscape was the strongest influence. The report also notes however that the findings obtained within wind farm catchment areas showed that impact on the landscape is not a major concern for those living near an existing wind farm.

With regards to the economic and environmental impacts of wind farm development, the national survey reveals that attitudes towards wind energy are influenced by a perception that wind is an attractive source of energy:

> *"Over 8 in 10 recognise wind as a non-polluting source of energy, while a similar number believe it can make a significant contribution to Ireland's energy requirements."*

The study reveals uncertainty among respondents with regards to the issues of noise levels, local benefits and the reliability or otherwise of wind power as an energy source. It goes on to state however that the finding that people who have seen wind farms rate these economic and environmental factors more favourably is a further indication that some experience of the structures tends to translate into positive attitudes towards wind energy.

Similar to the national survey, the surveys of those living within the vicinity of a wind farm also found that the findings are generally positive towards wind farms. Perceptions of the impact of the

[14] *Sustainable Energy Ireland 2003 Attitudes Towards The Development of Wind Farms in Ireland. Available at: https://mosart.ie/wp-content/uploads/2016/02/Attitudes-Towards-Wind-Farm-Development-Ireland.pdf*

development on the locality were generally positive, with some three-quarters of interviewees believing it had impacted positively.

In areas where a wind farm development had been granted planning permission but was not yet under construction, three quarters of the interviewees expressed themselves in favour of the wind farm being built in their area. Four per cent were against the development. The reasons cited by those who expressed themselves in favour of the wind farm included the fact that wind energy is clean (78%), it would provide local jobs (44%), it would help develop the area (32%) and that it would add to the landscape (13%).

Those with direct experience of a wind farm in the locality are generally impressed with it as an additional feature in the landscape. The report states:

> *"It is particularly encouraging that those with experience of wind turbines are most favourable to their development and that wind farms are not solely seen as good in theory but are also seen as beneficial when they are actually built."*

Few of those living in proximity either to an existing wind farm or one for which permission has been granted believe that the development damages the locality, either in terms of damage to tourism potential or to wildlife. The survey found that there is a clear preference for larger turbines in smaller numbers over smaller turbines in larger numbers.

5.3.9.1.3 Conclusions

The main findings of the SEAI survey indicate that the overall attitude to wind farms is "almost entirely positive". The study highlights that two-thirds of Irish adults are either very favourable or fairly favourable to having a wind farm built in their locality, with little evidence of a "Not In My Back Yard" (NIMBY) effect. The final section of the SEAI 2017 *Attitudes Towards the Development of Wind Farms in Ireland'* report, p. 41 states:

> *"The overwhelming indication from this study is that wind energy enjoys great support and, more specifically, that the development of wind farms is supported and welcomed. The single most powerful indicator of this is to be found among those living in proximity to an existing wind farm: over 60% would be in favour of a second wind farm or an extension of the existing one. This represents a strong vote in favour of wind farm developments – especially important since it is voiced by those who know from direct experience about the impact of such developments on their communities."*

5.3.9.2 IWEA Interactions Opinion Poll on Wind Energy 2021

In January 2021 IWEA published the results of their most recent nationwide annual poll on attitudes to wind energy, the *Public Attitudes Monitor.*[15] The results of the opinion poll were published via Wind Energy Ireland, the representative body for the Irish wind industry. The objective of the poll was to *'measure and track public perceptions and attitudes around wind energy amongst Irish adults.'*

Between 12th – 18th November 2020, a representative sample of 1,004 Irish adults together with a booster sample of 203 rural residents participated in an online survey. The 2020 results reported that 50% of the nationally representative sample 'strongly favour', 32% 'tend to favour' and 15% 'neither favour nor oppose' wind power. Of the rural population surveyed 42% 'strongly favour', 40% 'tend to favour' and 14% 'neither favour nor oppose' wind power. The survey has been run annually since 2017 and while there has been a marginal decrease in those in favour of wind power nationally during this

[15] *Wind Energy Ireland January 2021 Public Attitudes Monitor. Available at: https://windenergyireland.com/images/files/2032-wei-version-2020-for-media.pdf*

time (from 85% to 82%) there has been a marginal increase in those in favour from the rural population (from 79% to 82%).

Amongst those in favour of wind power, the majority cited environmental and climate concerns as their main reasons for supporting such developments. Other reasons cited for supporting wind energy developments include: 'economic benefits', 'reliable/efficient', 'positive experience with wind energy', and the view that it is a 'safe resource'.

When questioned about wind energy developments in their local area, 54% of the nationally representative sample either 'favour' or 'tend to favour' such proposals compared to 52% of the rural population reporting the same. There was a high level of agreement with positive benefits concerning wind energy the local area from both the nationwide and rural populations, with over 80% of each group in agreement that it 'reduces CO2 emissions' and is 'good for the environment', with over 75% of each group agreeing that it leads to 'cheaper electricity'. Over 60% of each population group agreed that wind energy 'supports energy independence' and 'creates employment'.

The IWEA November 2020 survey follows the structure of previous national opinion polls on wind energy undertaken since 2017. The 2020 survey results are consistent with previous year's figures and thus indicate that approximately 4 out of 5 Irish adults have continued to support wind energy in recent years.

5.3.9.2.1 *Conclusions*

The overall conclusions drawn from the survey findings and from the authors' review of previous studies show that local people become more favourable towards wind farms after construction, that the degree of acceptance increases with proximity to them, and that the NIMBY syndrome does not adequately explain variations in public attitudes due to the degree of subjectivity involved.

5.3.9.3 Wind Energy Ireland Interactions Opinion Poll on Wind Energy

In early 2024, Wind Energy Ireland (WEI) published the results of their most recent nationwide annual poll on attitudes to wind energy[16]. The objective of the poll was to 'measure and track public perceptions and attitudes around wind energy amongst Irish adults.'

Between 17th November and 1st December 2023, a nationally representative sample of 1,017 Irish adults together with a booster sample of 221 rural residents participated in the survey. The 2023 results reported that 4 in 5 (80%) are now in favour of wind power, a 6% increase on the 2021 results (54% of those in favour were 'strongly in favour'). The survey has been run annually since 2017 and while there has been a marginal decrease in those in favour of wind power nationally during this time (from 85% to 80%) there has been an increase in those in favour from the rural population (from 79% to 85%). The 2023 surveys results are largely in line with those of 2022, showing a consistent level of support and a positive attitude toward wind energy in Ireland.

Amongst those in favour of wind power, the majority cited cheaper electricity, reduced carbon emissions and environmental and climate concerns as their main reasons for supporting such developments. Other reasons cited for supporting wind energy developments include: 'Support energy independence', 'Creates employment', and that it is 'Good for local communities nearby'.

[16] *WEI Latest News – National Poll. Available at: << https://windenergyireland.com/latest-news/7660-national-poll-4-in-5-people-support-irish-wind-energy-development-with-3-in-5-backing-local-wind-farms#:~:text=we%20love%20wind!-,National%20poll%3A%204%20in%205%20people%20support%20Irish%20wind%20energy,5%20backing%20local%20wind%20farms.&text=4%20in%205%20people%20in,towards%20wind%20energy%20in%20Ireland.>>*

When polled on opinions surrounding the offshore wind energy sector, 78% of those surveyed said that they are in favour of the use of offshore wind energy in Ireland, with 80% acknowledging the importance of offshore wind energy in providing energy security to Ireland.

When questioned about wind energy developments in their local area, 3 in 5 (60%) of those surveyed would support such proposals, compared to 58% of the nationally representative sample and 56% of the rural population surveyed in 2022 reporting the same.

The Wind Energy Ireland 2023 survey follows the structure of previous national opinion polls on wind energy undertaken since 2017. The 2023 survey results are consistent with previous year's figures and thus indicate that approximately 4 out of 5 Irish adults have continued to support wind energy in recent years.

5.3.9.4 Public Perceptions of Wind Power in Scotland and Ireland Survey 2005

5.3.9.4.1 *Background*

A survey of the public perception of wind power in Scotland and Ireland was carried out in 2003/2004 by researchers at the School of Geography & Geosciences, University of St. Andrews, Fife and The Macaulay Institute, Aberdeen ('Green on Green: Public Perceptions of Wind Power in Scotland and Ireland', Journal of Environmental Planning and Management, November 2005). The aims of the study were to ascertain the extent to which people support or oppose wind power, to investigate the reasons for these attitudes and to establish how public attitudes relate to factors such as personal experience of operational wind farms and their proximity to them.

5.3.9.4.2 *Study Area*

Surveys were carried out at two localities in the Scottish Borders region, one surrounding an existing wind farm and one around a site at which a wind farm had received planning permission but had not yet been built. Surveys were also carried out in Ireland, at two sites in Counties Cork and Kerry, each of which had two wind farms in proximity to each other.

5.3.9.4.3 *Findings*

The survey of public attitudes at both the Scottish and Irish study sites concluded that large majorities of people are strongly in favour of their local wind farm, their personal experience having engendered positive attitudes. Attitudes towards the concept of wind energy were described as "overwhelmingly positive" at both study sites in Scotland, while the Irish survey results showed almost full support for renewable energy and 92% support for the development of wind energy in Ireland.

The results of the survey were found to agree with the findings of previous research, which show that positive attitudes to wind power increase through time and with proximity to wind farms. With regards to the NIMBY effect, the report states that where NIMBY-ism does occur, it is much more pronounced in relation to proposed wind farms than existing wind farms. The Scottish survey found that while positive attitudes towards wind power were observed among those living in proximity to both the proposed and existing wind farm sites, people around the proposed site were less convinced than those living in proximity to the existing site. Retrospective questioning regarding pre- and post-construction attitudes at the existing site found that attitudes remained unchanged for 65% of respondents. Of the 24% of people who altered their attitudes following experience of the wind farm, all but one became more positive. The report states:

"These results support earlier work which has found that opposition to wind farms arises in part from exaggerated perceptions of likely impact, and that the experience of living near a wind farm frequently

dispels these fears. Prior to construction, locals typically expect the landscape impacts to be negative, whereas, once in operation, many people regard them as an attractive addition."

The reasons that people gave for their positive attitude to the local wind farm were predominantly of a global kind, i.e. environmental protection and the promotion of renewable energy, together with opposition to a reliance on fossil fuels and nuclear power. Problems that are often cited as negative effects of wind farms, such as interference with telecommunications and shadow flicker were not mentioned at either site. With regards to those who changed to a more positive attitude following construction of the wind farm, the reasons given were that the wind farm is "not unattractive (62%), that there was no noise (15%), that community funding had been forthcoming (15%) and that it could be a tourist attraction (8%)".

The findings of the Irish survey reinforce those obtained at the Scottish sites with regards to the increase in positive attitudes to wind power through time and proximity to wind farms. The survey of public attitudes at the sites in Cork and Kerry found that the highest levels of support for wind power were recorded in the innermost study zone (0 – 5 kilometres from a point in between the pair of wind farms). The data also suggests that "those who see the wind farms most often are most accepting of the visual impact". The report also states that a previous Irish survey found that most of those with direct experience of wind farms do not consider that they have had any adverse effect on the scenic beauty of the area, or on wildlife, tourism or property values. Overall, the study data reveals "a clear pattern of public attitudes becoming significantly more positive following personal experience of operational wind farms".

With regards to wind farm size, the report notes that it is evident from this and previous research that wind farms with small numbers of large turbines are generally preferred to those with large numbers of smaller turbines.

5.3.9.4.4 Conclusions

The overall conclusions drawn from the survey findings and from the authors' review of previous studies show that local people become more favourable towards wind farms after construction, that the degree of acceptance increases with proximity to them, and that the NIMBY effect does not adequately explain variations in public attitudes due to the degree of subjectivity involved.

5.3.10 Property Values and Wind Farms

This section summarises the largest and most recent studies from the United States and the UK and also provides a summary of an Irish working paper by the Centre for Economic Research on Inclusivity and Sustainable (CERIS).

In 2023 CERIS published a working paper entitled *'Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach'*.[17] This paper looked at wind turbine developments in Donegal, Leitrim, Sligo, Mayo, Galway, Kerry and Cork and associated property values. This working paper utilised satellite imagery to identify individual turbines and sourced its housing data from www.daft.ie; while the published price on Daft is not equivalent to the final agreed sale price, it was assumed that the listing and transaction prices are correlated. The findings of this research revealed a potential decrease in property values of -14.7% within a 0-1km radius of a wind turbine. However, the sample size of only 225 houses within this range does not adequately represent the broader landscape of Irish rural housing and the distribution of wind turbines. The author states that there are 'no significant reductions in house prices beyond 1km' and that the effects seen within the 1km band were not persistent and diminished over the operational lifetime of the turbines. Considering that this is a working paper, based on a small sample size where local conditions have the potential to

[17] *Centre for Economic Research on Inclusivity and Sustainability (2023) Wind Turbines and House Prices Along the West of Ireland: A Hedonic Pricing Approach.* <https://www.universityofgalway.ie/media/researchsites/ceris/files/WP-2023-01.pdf>

disproportionately impact on the local housing market, further research is required before relying on its findings.

One of the largest study of the impact of wind farms on property values has been carried out in the United States. 'The Impact of Wind Power Projects on Residential Property Values in the United States: A multi-Site Hedonic Analysis', December 2009, was carried out by the Lawrence Berkley National Laboratory (LBNL) for the U.S Department of Energy. This study collected data on almost 7,500 sales of single-family homes situated within ten miles of 24 existing wind farms in nine different American states over a period of approximately ten years. The conclusions of the study are drawn from eight different pricing models including repeat sales and volume sales models. Each of the homes included in the study were visited to demonstrate the degree to which the wind facility was visible at the time of the sale, and the conclusions of the report state that "The result is the most comprehensive and data rich analysis to date on the potential impacts of wind energy projects on nearby property values."

The main conclusion of this study is as follows:

> *"Based on the data and analysis presented in this report, no evidence is found that home prices surrounding wind facilities are consistently, measurably, and significantly affected by either the view of wind facilities or the distance of the home to those facilities. Although the analysis cannot dismiss the possibility that individual or small numbers of homes have been or could be negatively impacted, if these impacts do exist, they are either too small and/or too infrequent to result in any widespread and consistent statistically observable impact."*

This study has been recently updated by LBNL who published a further paper entitled "A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States", in August 2013. This study analysed more than 50,000 home sales near 67 wind farms in 27 counties across nine U.S. states yet was unable to uncover any impacts to nearby home property values. The homes were all within 10 miles of the wind energy facilities - about 1,100 homes were within 1 mile, with 331 within half a mile. The report is therefore based on a very large sample and represents an extremely robust assessment of the impacts of wind farm development on property prices. It concludes that:

> *"Across all model Specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post announcement/pre-construction periods."*

The LBNL studies note that their results do not mean that there will never be a case of an individual home whose value goes down due to its proximity to a wind farm – however if these situations do exist, they are considered to be statistically insignificant. Therefore, although there have been claims of significant property value impacts near operating wind turbines that regularly surface in the press or in local communities, strong evidence to support those claims has failed to materialise in all the major U.S. studies conducted thus far.

In September 2023, the Energy Policy Journal published 'Commercial wind turbines and residential home values: new evidence from the universe of land-based wind projects in the United States.'[18] This study targeted urban counties in the United Stated with populations over 250,000 persons, and found that on average, after a commercial wind energy project is announced, houses located within 1 mile of a proposed wind energy project experience a decrease in value of 11% relative to homes located within 3-5 miles of the proposed wind energy project. The decline in property values was found to recover post construction with property value impacts becoming relatively small (~2%) and statistically insignificant 9 years or more after project announcement (roughly 5 years after operation begins). This suggests that the housing market is reacting negatively to the expectation of likely impacts (after announcement) and

[18] *Energy Policy (2023) Commercial wind turbines and residential home values: new evidence from the universe of land-based wind projects in the United States. Available at: https://www.sciencedirect.com/science/article/pii/S0301421523004226*

the heightened activity during construction, but after operation begins, those negative perceptions and related home price impacts appear to fade.

The US-based scientific literature on the topic is therefore inconclusive, with the studies summarised above providing contradictory conclusions. The text below summarises the UK studies on the topic.

A study was commissioned by RenewableUK and carried out by the Centre for Economics and Business Research (Cebr) in March 2014. The findings of the study were produced in a report titled '*The effect of wind farms on house prices'* and its main conclusions are:

- Overall, the analysis found that the county-wide property market drives local house prices, not the presence or absence of wind farms.
- The econometric analysis established that construction of wind farms at the five Sites examined across England and Wales has not had a detectable negative impact on house price growth within a five-kilometre radius of the Sites.

A study issued in October 2016 'Impact of wind Turbines on House Prices in Scotland' (2016) was published by Climate Exchange. Climate Exchange is Scotland's independent centre of expertise on climate change which exists to support the Scottish Governments policy development on climate and the transition to a low carbon economy. A copy of the report is included as Appendix 5-1 of this EIAR.

The report presents the main findings of a research project estimating the impact on house prices from wind farm developments. It is based on analysis of over 500,000 property sales in Scotland between 1990 and 2014. The key findings from the study (p.3) are:

- No evidence of a consistent negative effect on house prices: Across a very wide range of analyses, including results that replicate and improve on the approach used by Gibbons (2014), we do not find a consistent negative effect of wind turbines or wind farms when averaging across the entire sample of Scottish wind turbines and their surrounding houses. Most results either show no significant effect on the change in price of properties within 2km or 3km or find the effect to be positive.
- Results vary across areas: The results vary across different regions of Scotland. Our data does not provide sufficient information to enable us to rigorously measure and test the underlying causes of these differences, which may be interconnected and complex.

The UK scientific literature is strong in its conclusions that there are no significant effects on the change in price of properties close to wind farm developments, and that generally the county-wide property market drives local house prices, not the presence or absence of wind farms. This literature is contradictory to the working paper containing the only Irish study on the topic.

The literature described above demonstrates that there is insufficient evidence from the scientific literature and studies conducted to determine that there is the potential for a significant effect on property values as a result of the Proposed Lifetime Extension.

5.3.11 Residential Amenity

Residential amenity relates to the human experience of one's home, derived from the general environment and atmosphere associated with the residence. The quality of residential amenity is influenced by a combination of factors, including Site setting and local character, land-use activities in the area and the relative degree of peace and tranquillity experienced in the residence.

5.3.11.1 Proposed Lifetime Extension

The existing Taurbeg is located within a rural setting in north County Cork, approximately 3.5km south of Rockchapel village and approximately 10.5km west of Newmarket. The R576 Regional Road runs

west-east approximately 2.7 km north of the existing Taurbeg Wind Farm site. Land use currently comprises a mix of pastoral agriculture and private forestry. The surrounding land use predominantly comprises wind energy, pastoral agriculture, and private forestry commercial and residential use along local road. The site entrance is located in the northeast of the site, via the L5005 local road.

There are 6 no. Sensitive Receptors located within 1 kilometre of the existing turbines, all of which are located at a minimum of 731m from any turbine. The site has been operational for a 19 year period and complies with the 2006 WEDGs in relation to turbine setback from sensitive receptors i.e. a minimum 500m set back. The existing turbines also adhere to the 2019 draft WEDGs in relation to turbine setback from sensitive receptors i.e. a minimum 4 x tip height (108.2m x 4 =432.8m). Note however no update or final 2019 WEDGs were subsequently published.

Due to the timelines associated with the planning process for renewable energy projects and the commitment within the Climate Action Plan 2024 (CAP24) to publish new draft guidelines, it is possible that the draft Wind Energy Guidelines may be adopted during the consideration period for the current planning application. In April 2025, the Department of the Environment, Climate and Communications published the 'Climate Action Plan 2025' (CAP), however it does not provide an update on the commitments published in CAP24 relating to the publication timeline of the Draft DoEHLG 2019 Guidelines. At the time of submission of this application, there has been no public consultation or finalisation of new guidelines. As shown in Section 5.5, there is currently no shadow flicker occurrences on Sensitive Receptors within the Study Area.

When considering the amenity of residents in the context of the Proposed Lifetime Extension, there are three main potential impacts of relevance: 1) Shadow Flicker, 2) Noise, and 3) Visual Amenity. Shadow flicker and noise are quantifiable aspects of residential amenity while visual amenity is more subjective. Detailed shadow flicker and noise impact assessments have been completed as part of this EIAR (Section 5.5 refers to shadow flicker, Chapter 12 addresses noise and vibration). A comprehensive landscape and visual impact assessment on the continuation of the Taurbeg Wind Farm has also been carried out, as presented in Chapter 13 of this EIAR. Impacts on the local population during the extended operational and decommissioning phases of the Proposed Lifetime Extension are assessed in relation to each of these key topics and other environmental factors such as noise, traffic, and dust; see Impacts in Section 5.6 below. The impact on residential amenity is then derived from an overall judgement of the combination of impacts due to shadow flicker, changes to land-use and visual amenity, noise, traffic, dust and general disturbance.

5.3.11.2 Proposed Offsetting Measures

The Proposed Offsetting Lands are located in the townlands of Knockatee and Coom, Co. Kerry, approximately 12km east from the Taurbeg Wind Farm site. The closest settlements to the Proposed Offsetting Lands are Castleisland and Ballydesmond, both of which are ~8km west and 7.2km southeast of the lands respectively. Land use at the Proposed Offsetting Lands comprises of commercial forestry and agricultural pastures. Land use in the wider area consists of forestry and agricultural pastures, with renewable energy also being prominent in the area. Restoration of farmland habitat and deforestation of commercial forestry are proposed as part of the Proposed Offsetting Measures. When considering residential amenity in respect of the Proposed Offsetting Measures, there are two main potential impacts of relevance 1: Noise and 2) Visual amenity. Whilst noise prediction calculations have been conducted and thus impacts are quantifiable, impacts on visual amenity are much more subjective. The predicted effects for both of these aspects are outlined below:

1) As outlined in Chapter 12 of this EIAR, 'Noise and Vibration', there are no significant effects anticipated as a result of the Proposed Offsetting Measures.
2) As outlined in Chapter 13 of this EIAR, 'Landscape and Visual', there will be positive, long-term, not significant effects on visual effects associated with the Proposed Offsetting Measures.

There are therefore no significant impacts on residential amenity associated with the Proposed Offsetting Measures

5.4 Health

5.4.1 Introduction

As set out in the Department of Housing, Planning, Community and Local Government '*Key Issues Consultation Paper on the Transposition of the EIA Directive 2017*' and the guidance listed in Section 1.2.2 of Chapter 1: Introduction of this EIAR, the consideration of the effects on populations and on human health in an EIAR should focus on health issues and environmental hazards arising from the other environmental factors, for example water contamination, air pollution, noise, accidents, disasters. Wind Turbine Health Impact Studies

While there are anecdotal reports of negative health effects on people who live very close to wind turbines, peer-reviewed research has not supported these statements. There is currently no published credible scientific evidence to positively link wind turbines with adverse health effects. The main publications supporting the view that there is no evidence of any direct link between wind turbines and health are summarised below.

1. ***'Wind Turbine Syndrome – An independent review of the state of knowledge about the alleged health condition', Expert Panel on behalf of Renewable UK, July 2010***

This report consists of three reviews carried out by independent experts to update and understand the available knowledge of the science relating to infrasound generated by wind turbines. This report was prepared following the publication of a book entitled 'Wind Turbine Syndrome', in 2009 by Dr. Pierpont, which received significant media attention at the time. The report discusses the methodology and assessment carried out in the 2009 publication and assessed the impact of low-frequency noise from wind turbines on humans. The independent review found that:

- "The scientific and epidemiological methodology and conclusions drawn (in the 2009 book) are fundamentally flawed;
- The scientific and audiological assumptions presented by Dr Pierpont relating infrasound to WTD are wrong; and
- Noise from Wind Turbines cannot contribute to the symptoms reported by Dr. Pierpoint's respondents by the mechanisms proposed."

Accordingly, the consistent and scientifically robust conclusion remains that there is no evidence to demonstrate any significant health effects in humans arising from noise at the levels of that generated by wind turbines.

2. ***'Wind Turbine Sound and Health Effects – An Expert Panel Review', American Wind Energy Association and Canadian Wind Energy Association, December 2009***

This expert panel undertook extensive review, analysis and discussion of the large body of peer-reviewed literature on sound and health effects in general, and on sound produced by wind turbines in particular. The panel assessed the plausible biological effects of exposure to wind turbine sound. Following review, analysis, and discussion of current knowledge, the panel reached consensus on the following conclusions:

- "There is no evidence that the audible or sub-audible sounds emitted by wind turbines have any direct adverse physiological effects.
- The ground-borne vibrations from wind turbines are too weak to be detected by, or to affect, humans.
- The sounds emitted by wind turbines are not unique. There is no reason to believe, based on the levels and frequencies of the sounds and the panel's experience with sound exposures in occupational settings, that the sounds from wind turbines could plausibly have direct adverse health consequences."

The report found, amongst other things, that:

- "Wind Turbine Syndrome" symptoms are the same as those seen in the general population due to stresses of daily life. They include headaches, insomnia, anxiety, dizziness, etc.
- Low frequency and very low-frequency 'infrasound' produced by wind turbines are the same as those produced by vehicular traffic and home appliances, even by the beating of people's hearts. Such 'infrasounds' are not special and convey no risk factors;
- The power of suggestion, as conveyed by news media coverage of perceived 'wind-turbine sickness', might have triggered 'anticipatory fear' in those close to turbine installations."

3. *'A Rapid Review of the Evidence', Australian Government National Health and Medical Research Council (NHMRC) Wind Turbines & Health, July 2010*

The purpose of this paper was to review evidence from current literature on the issue of wind turbines and potential impacts on human health and to validate the finding of the 'Wind Turbine Sound and Health Effects - An Expert Panel Review' (see Item 2 above) that:

- "There are no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following existing planning guidelines."
- There is currently no published scientific evidence to positively link wind turbines with adverse health effects.
- 'This review of the available evidence, including journal articles, surveys, literature reviews and government reports, supports the statement that: There are no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following existing planning guidelines."

4. *'Position Statement on Health and Wind Turbines', Climate and Health Alliance, February 2012*

The Climate and Health Alliance (CAHA) was established in August 2010 and is a coalition of health care stakeholders who wish to see the threat to human health from climate change and ecological degradation addressed through prompt policy action. In its Position Statement in February 2012, CAHA states that:

> *"To date, there is no credible peer reviewed scientific evidence that demonstrates a direct causal link between wind turbines and adverse health impacts in people living in proximity to them. There is no evidence for any adverse health effects from wind turbine shadow flicker or electromagnetic frequency. There is no evidence in the peer reviewed published scientific literature that suggests that there are any adverse health effects from infrasound (a component of low frequency sound) at the low levels that may be emitted by wind turbines."*

The Position Statement explores human perceptions of wind energy and notes that some people may be predisposed to some form of negative perception that itself may cause annoyance. It states that:

> *"Fear and anxious anticipation of potential negative impacts of wind farms can also contribute to stress responses, and result in physical and psychological stress symptoms... Local concerns about wind farms can be related to perceived threats from changes to their place and can be considered a form of "place-protection action", recognised in psychological research about the importance of place and people's sense of identity."*

CAHA notes the existence of *"misinformation about wind power"* and, in particular, states that:

"Some of the anxiety and concern in the community stems originally from a self-published book by an anti-wind farm activist in the United States which invented a syndrome, the so-called "wind turbine syndrome". This is not a recognised medical syndrome in any international index of disease, nor has this publication been subjected to peer review."

CAHA notes that:

"Large scale commercial wind farms however have been in operation internationally for many decades, often in close proximity to thousands of people, and there has been no evidence of any significant rise in disease rates."

This, it states, contrasts with the health impacts of fossil fuel energy generation.

5. ***'Wind Turbine Health Impact Study -Report of Independent Expert Panel' – Massachusetts Departments of Environmental Protection and Public Health (2012)***

An expert panel was established with the objective to, inter alia, evaluate information from peer-reviewed scientific studies, other reports, popular media and public comments and to assess the magnitude and frequency of any potential impacts and risks to human health associated with the design and operation of wind energy turbines. In its final report, the expert panel set out its conclusions under several headings, including noise and shadow flicker.

In relation to noise, the panel concluded that there was limited or no evidence to indicate any causal link between noise from wind turbines and health effects, including the following conclusions:

"There is no evidence for a set of health effects, from exposure to wind turbines that could be characterized as a "Wind Turbine Syndrome."

"The strongest epidemiological study suggests that there is not an association between noise from wind turbines and measures of psychological distress or mental health problems. There were two smaller, weaker, studies: one did note an association, one did not. Therefore, we conclude the weight of the evidence suggests no association between noise from wind turbines and measures of psychological distress or mental health problems."

"None of the limited epidemiological evidence reviewed suggests an association between noise from wind turbines and pain and stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and headache/migraine."

In relation to shadow flicker, the expert panel found the following:

"Scientific evidence suggests that shadow flicker does not pose a risk for eliciting seizures as a result of photic stimulation.

There is limited scientific evidence of an association between annoyance from prolonged shadow flicker (exceeding 30 minutes per day) and potential transitory cognitive and physical health effects."

6. ***Wind Turbines and Health, A Critical Review of the Scientific Literature, Massachusetts Institute of Technology (Journal of Occupational and Environmental Medicine Vol. 56, Number 11, November 2014)***

This review assessed the peer-reviewed literature regarding evaluations of potential health effects among people living in the vicinity of wind turbines. The review posed a number of questions around the effect of turbines on human health, with the aim of determining if stress, annoyance or sleep disturbance occur as a result of living in proximity to wind turbines, and whether specific aspects of

wind turbine noise have unique potential health effects. The review concluded the following with regard to the above questions:

- Measurements of low-frequency sound, infrasound, tonal sound emission, and amplitude-modulated sound show that infrasound is emitted by wind turbines. The levels of infrasound at customary distances to homes are typically well below audibility thresholds.
- No cohort or case–control studies were located in this updated review of the peer-reviewed literature. Nevertheless, among the cross-sectional studies of better quality, no clear or consistent association is seen between wind turbine noise and any reported disease or other indicator of harm to human health.
- Components of wind turbine sound, including infrasound and low frequency sound, have not been shown to present unique health risks to people living near wind turbines.
- Annoyance associated with living near wind turbines is a complex phenomenon related to personal factors. Noise from turbines plays a minor role in comparison with other factors in leading people to report annoyance in the context of wind turbines.

A further 25 reviews of the scientific evidence that universally conclude that exposure to wind farms and the sound emanating from wind farms does not trigger adverse health effects, were compiled in September 2015 by Professor Simon Chapman, of the School of Public Health and Sydney University Medical School, Australia, and is included as Appendix 5-2 of this EIAR.

7. *Position Paper on Wind Turbines and Public Health: HSE Public Health Medicine Environment and Health Group, February 2017*

The Health Service Executive (HSE) position paper on wind turbines and public health was published in February 2017 to address the rise in wind farm development and concerns regarding potential impacts on public health. The paper discusses previous observations and case studies which describe a broad range of health effects that are associated with wind turbine noise, shadow flicker and electromagnetic radiation.

A number of comprehensive reviews conducted in recent years to examine whether these health effects are proven has highlighted the lack of published and high-quality scientific evidence to support adverse effects of wind turbines on health.

8. *Environmental Noise Guidelines for the European Region: World Health Organisation Regional Office for Europe, 2018.*

The WHO Environmental Noise Guidelines provide recommendations for protecting human health from exposure to environmental noise originating from various sources such as transportation noise, wind turbine noise and leisure noise. The Guideline Development Group (GDG) defined priority health outcomes and from this were able to produce guideline exposure levels for noise exposure.

For average noise exposure, the GDG conditionally recommends reducing noise levels produced by wind turbines below 45 dB Lden. The GDG recognise the potential for increased risk of annoyance at levels below this value but cannot determine whether this increased risk can impact health. Wind turbine noise above this level is associated with adverse health effects.

The GDG points out that evidence on health effects from wind turbine noise (apart from annoyance) is either absent or rated low/very low quality and effects related to attitudes towards wind turbines are hard to differentiate from those related to noise and may be partly responsible for the associations. The GDG also recognises that the percentage of people exposed to noise from wind turbines is far lower than other sources such as road traffic and state that any benefit from specifically reducing population exposure to wind turbine noise in all situations remains unclear.

That being said, the GDG recommends renewable energy policies include provisions to ensure noise levels from wind farm developments do not rise above the guideline values for average noise exposure. The GDG also provides a conditional recommendation for the implementation of suitable measures to reduce noise exposure. Please see Chapter 12 of this EIAR: Noise and Vibration for details.

9. ***'The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive Health Adults' Woolcock Institute for Medical Research, New South Wales, Australia***[19]

When considering the effects of health regarding noise sensitivity generated from the Proposed Lifetime Extension , an analysis of a recent study by the Woolcock Institute for Medical Research, New South Wales, Australia.

The purpose of this study was to examine the potential health effects of audible sound and inaudible infrasound has on noise sensitive adults over a period of 72 hours. Sufferers of wind turbine syndrome (WTS) have attributed their ill-health and particularly their sleep disturbance to the signature of infrasound. On this basis, the objectives of the study were to test the effects of 72 hours of infrasound exposure on human physiology, particularly sleep. The results of the study are outlined below:

- All staff and participants were asked whether they were able to differentiate in any way between infrasound and sham infrasound (the control), and none of them were able to.
- The study found that 72 hours of the simulated wind turbine infrasound (~90dB pk re 20 µPa) in controlled laboratory conditions did not worsen any measure of sleep quality compared with the same speakers being present but not generating infrasound (sham infrasound).
- The study found no evidence that 72 hours of exposure to a sound level of ~90dB pk re 20 µPa of simulated wind turbine infrasound in double-blind conditions perturbed any physiological or psychological variable.
- None of the participants in the study who were exposed to infrasound developed what could be described as Wind Turbine Syndrome.
- This study suggests that the infrasound component of Wind Turbine Syndrome is unlikely to be a cause of any ill-health or sleep disruption, although this observation should be independently replicated.

10. **Infrasound Does Not Explain Symptoms Related to Wind Turbines: Finnish Government's Analysis, Assessment and Research Activities (VN TEAS), 2020**

The study targeted to adverse health effects of wind turbine infrasound and was funded by the Finnish Government's Analysis, Assessment and Research Activities (VN TEAS).

It was found that the low-frequency, inaudible sounds made by wind turbines are not damaging to human health despite fears that they cause unpleasant symptoms. The project, which was carried out over two years, examined the impact of low-frequency—or infrasound—emissions which cannot be picked up by the human ear.

People in many countries have blamed the infrasound waves for symptoms ranging from headaches and nausea to tinnitus and cardiovascular problems, researchers said.

Interviews, sound recordings and laboratory tests were used to explore possible health effects on people living within 20 kilometres (12 miles) of the generators.

The report notes:

> *'...the behavioural findings of the current study suggest that wind turbine infrasound cannot be reliably perceived and it does not result in increased annoyance. Participants that showed health effects did not show signs of increased infrasound sensitivity and did not rate wind turbine sounds more annoying.*

As a result:

> *'These findings do not support the hypothesis that infrasound is the element in turbine sound that causes annoyance. Instead, they suggest that people who have health symptoms which they associate with wind turbine sound are not likely to have these symptoms because they perceive turbine sound more annoying than controls, at least in laboratory settings. It is more likely that these symptoms are triggered by other factors such as symptom expectancy'.*

5.4.2 Baseline

5.4.2.1 Proposed Lifetime Extension

Table 5-16 below details the general health of persons by percentage for the State, County Cork and the Proposed Lifetime Extension Population Study Area for the most recent census taken in Ireland, 2016 and 2022, which have data publicly available. In general, the percentage health breakdown for the State, County and study area populations are similar. The Study Area, State and County all reported in the range of 80-90% for a combined 'very good' and 'good' health. In 2022, 86.6% of people in Cork stated that their health was good or very good compared with 89.5% in 2016. This is a similar trend to the national figures, which also showed a 4% decrease in the good/very good categories, from 87% to 83%. For Clonfert East, there was an increase in good/very good categories, from 83.7% in 2016 to 86.2% in 2022.

Table 5-16: Percentage General Health Breakdown for the study area as reported in the 2016 and 2022 Census – Proposed Lifetime Extension (Source www. CSO.ie)

Study Area- Electoral Divisions	Very Good		Good		Fair		Bad		Very Bad		Not Stated	
	2016	2022	2016	2022	2016	2022	2016	2022	2016	2022	2016	2022
State	59.4%	53.2%	27.6%	29.7%	8%	8.6%	1.3%	1.4%	0.3%	0.3%	3.3%	6.7%
County Cork	63.1%	57%	26.4%	29.6%	6.9%	7.8%	1.0%	1.1%	0.2%	0.3%	2.3%	4.2%
Clonfert East	51.7%	50.1%	32%	36.1%	12.3%	10.4%	1.3%	1.1%	0.3%	0.0%	2.36%	2.3%

5.4.2.2 Proposed Offsetting Measures

Table 5-17 below details the general health of persons by percentage for the State, County Kerry and the Proposed Offsetting Measures Population Study Area for the most recent census taken in Ireland, 2016 and 2022, which have data publicly available. In general, the percentage health breakdown for the State, County and study area populations are broadly similar. The Study Area, State and County all reported in the range of 80-95% for a combined 'very good' and 'good' health. In 2022, 83.4% of people in Kerry stated that their health was good or very good compared with 86.3% in 2016. This is a similar

trend to the national figures, which also showed a 4% decrease in the good/very good categories, from 87% to 83%. For Mount Eagle, there was also a decrease in good/very good categories, from 87.6% in 2016 to 84.4% in 2022.

Table 5-17: Percentage General Health Breakdown for the study area as reported in the 2016 and 2022 Census – Proposed Offsetting Measures (Source www. CSO.ie)

Study Area- Electoral Divisions	Very Good		Good		Fair		Bad		Very Bad		Not Stated	
	2016	2022	2016	2022	2016	2022	2016	2022	2016	2022	2016	2022
State	59.4 %	53.2%	27.6%	29.7%	8%	8.6%	1.3%	1.4%	0.3%	0.3%	3.3%	6.7%
County Kerry	56.5 %	51.7%	29.8%	31.7%	8.5%	9.2%	1.3%	1.4%	0.3%	0.3%	3.6%	5.7%
Mount Eagle	68.4 %	62.6%	19.2%	21.8%	9.0%	9.8%	2.3%	2.3%	0.0%	1.1%	1.13%	2.3%

5.4.2.3 Air Quality- Dust, NO_2, PM_{10} and PM_{25} and CO_2 Emissions

5.4.2.3.1 *Proposed Lifetime Extension*

Chapter 10 Air Quality and Chapter 11 Climate assess the potential for impact to human health from dust, CO_2 and other noxious emissions generated by additional vehicles. The assessments consider the operation and decommissioning phases. The assessments concluded that the residual effects from the extended operational and decommissioning phases of the Proposed Lifetime Extension are not significant. Please see Chapter 10 and Chapter 11 for further details.

5.4.2.3.2 *Proposed Offsetting Measures*

Chapter 10 Air Quality and Chapter 11 Climate assess the potential for impact to human health from dust, CO_2 and other noxious emissions generated by additional vehicles associated with the Proposed Offsetting Measures works. The assessments concluded that the residual effects are not significant. Please see Chapter 10 and Chapter 11 for further details.

5.4.2.4 Water quality

5.4.2.4.1 *Proposed Lifetime Extension*

There are no underground water or sewerage networks within the Site. The Tobergal Public Water Scheme is located approximately 16km northeast of the existing infrastructure. There are no private boreholes or wells in the vicinity of the Site. Chapter 9 Hydrology and Hydrogeology assess the potential for impact on public water supply and private wells during the operation and decommissioning phases.

5.4.2.4.2 *Proposed Offsetting Measures*

As outlined in Chapter 9, Hydrology and Hydrogeology, there will be no significant effects on water quality associated with the Proposed Offsetting Measures.

5.4.2.5 Noise and Vibration

5.4.2.5.1 *Proposed Lifetime Extension*

Chapter 12 Noise and Vibration assesses the potential for noise and vibration impacts during the operation and decommissioning phases of the Proposed Lifetime Extension and during the Proposed Offsetting Measures. The assessment includes mitigation and monitoring measures that will be complied with for the operation, and decommissioning phases.

5.4.2.5.2 *Proposed Offsetting Measures*

As outlined in Section 5.3.11.2 above, as well as Chapter 12, Noise and Vibration, there will be no significant effects relating to noise and vibrations as a result of the Proposed Offsetting Measures works.

5.4.2.6 Traffic and Transport

5.4.2.6.1 *Proposed Lifetime Extension*

Chapter 15 Material Assets assesses the potential for traffic and transport impacts during the operation and decommissioning of the Proposed Lifetime Extension.

5.4.2.6.2 *Proposed Offsetting Measures*

Chapter 15 Material Assets assesses the potential for traffic and transport impacts during the Proposed Offsetting Measures. There are no significant effects on traffic and transport associated with the Proposed Offsetting Measures.

5.4.2.7 Aviation

5.4.2.7.1 *Proposed Lifetime Extension*

The provision of aviation lighting on wind turbines is a standard and accepted part of any wind farm development. As such, aviation lighting is already in place on T11 which was agreed with the IAA as part of the original consented development. Aviation lighting is a safety requirement of the Irish Aviation Authority (IAA). The standard lighting required by the IAA are medium intensity lights. Such lighting is designed specifically for aviation safety and is not intended to be overbearing or dominant when viewed from the ground thus striking a reasonable balance between aviation safety and visual impact. Where existing turbine lighting needs to be updated for the Proposed Lifetime Extension, this will be carried out with agreement and recommendation from the IAA and Irish Air Corps should the project receive planning permission.

It is considered that aviation lighting on the turbines will continue to have no significant effect on human health, beyond increasing aircraft safety in the context of the Proposed Lifetime Extension. The applicant will continue its engagement with IAA and Irish Air Corps as required in relation to aviation lighting.

5.4.2.7.2 *Proposed Offsetting Measures*

The Proposed Offsetting Measures will not have any significant effects on aviation.

5.4.2.8 Vulnerability of the Project to Natural Disaster and Major Accidents

A risk assessment of the Proposed Project's vulnerability to and from natural disasters can be found in Chapter 16 Major Accidents and Natural Disasters of this EIAR. A brief discussion can be found below.

5.4.2.8.1 *Proposed Lifetime Extension*

Pollution/Contamination/Fire

A wind farm is not a recognised source of pollution. Should a major accident or natural disaster occur the potential sources of pollution on-site during the extended operational and decommissioning phases are limited. Sources of pollution with the potential to cause environmental pollution and associated negative effects on health such as bulk storage of hydrocarbons or chemicals, storage of wastes etc. are limited. Consequently, it is considered that the risk of significant fire occurring, affecting the Existing Taurbeg Wind Farm and causing the wind farm to have significant environmental effects is limited and therefore a significant effect on human health is similarly limited. As described earlier, there are no significant sources of pollution associated with the Proposed Lifetime Extension with the potential to cause environmental or health effects. Also, the spacing of the turbines and distance of turbines from any properties limits the potential for impacts on human health. Turbine safety is addressed in Section 5.1.4.1 above.

Flooding

The Knockahorrea East watercourse flows through the east of the Site which is not susceptible to flooding and has no record of previous flooding events. Approximately 5km downstream of the Site at the confluence of the Knockahorrea East River and the Feale River at Rockchapel, there is a record of a flooding event which occurred in 1986 (Flood ID: 2414). Approximately 7km downstream of the Site on the Glenlara River, near the confluence with the Dalua River, there is a record of recurring flooding on the R578 caused by high flows in the Dalua River (Flood ID: 5153).

The existing Taurbeg Wind Farm is located on Taurbeg hill. The steep topography of the area, and the associated high gradients of the streams which drain it, preclude any risk of flooding in its vicinity.

Further details regarding hydrology and flood risk are provided in Chapter 9 Hydrology and Hydrogeology.

Stability/Landslide

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the Site of the accident. The existing Taurbeg Wind Farm is not regulated by or connected to or close to, any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e., SEVESO sites and so there are no potential effects from this source.

There is low potential for significant natural disasters to occur at the Site. Ireland is a geologically stable country with a mild temperate climate. The Proposed Lifetime Extension has low potential to cause natural disasters or major accidents. As detailed in Chapter 8 Land Soil and Geology, while there are sections of peat identified within the Site on the published soils map (www.epa.ie) and published subsoils maps (www.gsi.ie), very shallow peat was only encountered at some locations:

- No peat was encountered at T7 on the lower ground in the east of the Site.

- A gouge core completed in the vicinity of T7 encountered brown silty clayey soils. Where present the peat depths across the Site range from 0.1 to 1.8m.
- The peat is typically shallow with only 2 no. gouge cores encountering peat depths in excess of 0.5m. 1.65m of peat was encountered near T8 whilst 1.8m of peat was encountered near T12.

The gouge cores typically encountered an orange-brown gravelly clay beneath the peat. Blanket bog is found at the Site which has been significantly degraded due to agricultural land improvement and commercial forestry. The existing Taurbeg Wind Farm is located in an upland site, therefore there is potential for peat slides. The GSI have classified this area with a moderately low-moderately high potential for landslides. There is no record of peat slides occurring at the wind farm site during its operational period.

The GSI do not record the occurrence of any historic landslides within the Site (www.gsi.ie). The closest recorded landslide is located ~11km to the west. this event dates from November 2020 and is described as a peat slide which occurred in an area of mixed forestry at Knockfeha, Co. Kerry. A historic landslide is also mapped ~12km to the southeast of the Site. This landslide near Kanturk dates from 1839 and is described as a peat slide which occurred in a blanket bog in which the peat was over 10ft thick.

The GSI Landslide Susceptibility Map (www.gsi.ie) classifies the probability of a landslide occurring. The landslide susceptibility of the Wind Farm Site was classified by the GSI (2023) as ranging from "low" to "high". The areas of susceptibility are localised, with the majority of the Site having "low" to "moderately low" landslide susceptibility.

The original EIAR) Pl. Reg. Ref: N/02/3608) found that the existing Taurbeg Wind Farm was suitable from a peat stability perspective, and the existing windfarm was constructed without any peat stability issues. The main risk was related to the construction work activities and earthworks associated with the construction of the wind farm. The risks are significantly lower for an operational wind farm.

Further details on the risk of instability and potential failures, are discussed in Chapter 8 on Land, Soils, and Geology and Appendix 8-1 Peat Stability Risk Assessment.

5.4.2.8.2 *Proposed Offsetting Measures*

Pollution/Contamination/Fire

The potential for the release of hydrocarbons and sediments associated with deforestation to groundwater and watercourse receptors is a risk to surface water, groundwater quality, and the aquatic quality of the surface water receptors at the Proposed Offsetting Lands. Proven and effective measures to mitigate the risk of releases of hydrocarbons and sediments have been proposed in Chapter 9, Hydrology and Hydrogeology, and will break the pathway between the potential source and each receptor. It is considered that the risk of significant fire occurring at the Proposed Offsetting Lands is limited and therefore a significant effect on human health is similarly limited.

Flooding

The OPW Past Flood Events Maps have no records of recurring or historic flood instances in the vicinity of the Proposed Offsetting Lands. Furthermore, the Proposed Offsetting Lands are not mapped within any historic or modelled groundwater flood zones. The main risk of flooding at the Proposed Offsetting Lands is via pluvial flooding. This risk is limited to local flat areas within the Site due to the mountainous nature of the wider area. Surface water ponding/pluvial flooding may occur in some local

flat areas due to the presence of low permeability peat at the surface. Mostly the risk of pluvial flooding is low. In general, the risk of flooding is very low at the Proposed Offsetting Lands.

Further details regarding hydrology and flood risk are provided in Chapter 9 Hydrology and Hydrogeology.

Stability/Landslide

The GSI record a historic landslide immediately to the south of the Proposed Offestting Lands. This landslide event dates from 15th November 2020 and is described as a peat flow. Based on the inspection of recent aerial imagery, there appears to have been 2 no. peat slides in the lands to the southwest of the Proposed Offsetting Lands (Area 4). The GSIs landslide susceptibility of the Proposed Offsetting Lands was classified by the GSI (2023) as ranging from "low" to "high". The areas of high susceptibility are located on the western slopes of Mount Eagle.

GDG completed detailed walkover surveys and peat probing in the areas of these historic peat slides. The PSRA concludes that the main conditioning factors which led to the peat slides included:

- The cutting of artificial drainage ditches parallel to topographic contours which may have resulted in localised surface water ponding, leading to increased lubrication and buoyancy at the base of the peat profile.
- Areas of extremely wet, saturated peat were recorded by GDG in the vicinity of the source zones with very low shear vane readings.
- The presence of a slight convex break in slope close to the assumed failure initiation points.
- The afforested and drained nature of the area is hypothesised to have contributed to disruption of the hydrological regime.
- Mount Eagle A is likely to have been instrumental in condition the failure of Mount Eagle B as it removed lateral and downslope support

The findings of the PSRA at the Proposed Offsetting Lands showed that the lands predominantly have an acceptable margin of safety and are suitable for the Proposed Offsetting Measures. Some very localised areas are deemed to have a higher risk of instability due to local topography. It is considered that these areas do not present a significant peat slide risk if the mitigation measures outlined in Section 8 of the PSRA (Appendix 8-1) are implemented, and that the residual risk is manageable.

Based on the available data, the fieldwork, and GDG's professional judgement, it is concluded that significant peat slides are unlikely on the Proposed Offsetting Lands with diligent peat management and careful consideration of the peat conditions at the Proposed Offsetting Lands during the works associated with the Proposed Offsetting Measures.

5.4.2.9 Health Baseline Summary

Chapter 8: Land, Soils and Geology, Chapter 9: Hydrology and Hydrogeology, Chapter 10: Air Quality, Chapter 11: Climate, Chapter 12: Noise and Vibration and Chapter 15: Material Assets (Traffic and Transport) provide an assessment of the effects of the Proposed Lifetime Extension and Proposed Offsetting Measures on these areas of consideration. Chapter 16 assesses the vulnerability of the Proposed Lifetime Extension and Proposed Offsetting Measures to and from major accidents and natural disasters. There is the potential for negative effects on human health during the wind farm operation and decommissioning phases related to potential emissions to air of dust, potential emissions to land and water of hydrocarbons, release of potentially silt-laden runoff into watercourses and noise emissions. The assessments in the chapters listed above show that the residual effects will not lead to significant effects on any environmental media with the potential to lead to health effects for humans. The Noise and Vibration assessment concludes the residual effects for Sensitive Receptors within the

study are neutral and imperceptible for the extended operational phase. Furthermore, the Taurbeg Wind Farm noise emissions and shadow flicker are controllable via inbuilt technologies, and therefore can comply with the conditions imposed should a grant of planning permission be received. Likewise, the vulnerability the project to/from potential for natural disasters has been assessed as low risk for all phases.

On this basis, the potential for negative health effects associated with the Proposed Lifetime Extension during all phases and the Proposed Offsetting Measures are considered to be not significant. Furthermore, the existing Taurbeg Wind Farm is capable of offsetting carbon emissions associated with the burning of fossil fuels. During the Proposed Lifetime Extension, the existing Taurbeg Wind Farm will have a medium term, moderate positive effect on air quality as set out in Chapter 10 Air Quality which will contribute to positive effects on human health.

5.5 Shadow Flicker Modelling

5.5.1 Daily and Annual Shadow Flicker Results

The software package WindPRO version 4.0.423 was used to model the predicted daily and annual shadow flicker levels in significant detail, identifying the predicted daily start and end times, maximum daily duration and the individual turbines predicted to give rise to shadow flicker.

The model results assume worst-case conditions, including:

- 100% sunshine during all daylight hours throughout the year,
- No cloud cover during all daylight hours throughout the year,
- An absence of any screening (vegetation or other buildings),
- That the turbine rotors are facing the property, and
- That the turbine rotors are moving.

The maximum shadow flicker model assumes that daylight hours consist of 100% sunshine. This is a conservative assumption which represents a worst-case scenario. Following the detail provided above on sunshine hours, a sunshine factor of 33.4% has been applied. Taking these probabilities into consideration, an approximation of the 'estimated actual' annual shadow flicker occurrence has been calculated and is presented in Table 5-18.

The predicted maximum daily and annual shadow flicker levels are then considered in the context of the 2006 WEDGs daily threshold of 30 minutes per day and annual threshold of 30 hours per year.

The 2006 WEDGs recommend that shadow flicker at dwellings within 500 metres of a existing turbine location should not exceed a total of 30 minutes per day or 30 hours per year. As noted in Section 5.2.3 above, the closest Sensitive Receptor H10 is located 731m from the nearest turbine T8.

The predicted shadow flicker levels have been modelled for all 3 no. Sensitive Receptors located within the Shadow Flicker Study Area (as defined in Section 5.2.3 above). Of these, none of the Sensitive Receptors are expected to experience shadow flicker. Table 5-18 illustrates the shadow flicker results from the Proposed Lifetime Extension.

Table 5-18: Shadow Flicker Results for Taurbeg Wind Farm

Sensitive Receptor ID	ITM Coordinates (Easting)	ITM Coordinates (Northing)	Description	Distance to Nearest Turbine (metres)	Nearest Existing turbine No.	Max. Daily Shadow Flicker: Pre-Mitigation (hrs:min:sec)	Max. Annual Shadow Flicker: Pre-Mitigation (hrs:min:sec)	Max. Annual Shadow Flicker Adjusted for Average Regional Sunshine (hrs:min:sec)	Existing turbine(s) Giving Rise to Daily Shadow Flicker Exceedance	Mitigation Strategy Required (Daily)
H10	521589	611206	Sensitive Receptor	731	T8	00:00:00	0:00:00	0:00:00	N/A	No
H28	522359	610340	Sensitive Receptor	829	T10	00:00:00	0:00:00	0:00:00	N/A	No
H33	521492	611181	Sensitive Receptor	821	T8	00:00:00	0:00:00	0:00:00	N/A	No

5.5.2 Cumulative Shadow Flicker

Knockacummer Wind Farm is the closest wind farm to the existing Taurbeg Wind Farm, located east of the Taurbeg at a distance of approximately 881m between the wind farms closest turbines. When applying a 10x rotor diameter buffer zone to the Knockacummer turbine locations it was found that the respective shadow flicker study areas of Knockacummer Wind Farm overlaps with the Taurbeg Wind Farm Shadow Flicker Study Area. However, there are no permitted or existing Sensitive Receptors located within the overlapping areas, therefore there is no potential cumulative shadow flicker effects.

5.6 Likely Significant Impacts and Associated Mitigation Measures

The below assessment evaluates the impact (where there is the potential for an impact to occur) on health and safety, employment, population, land-use, tourism, noise, dust, traffic, shadow flicker and residential amenity during the operation and decommissioning phases, as a result of the Proposed Project.

5.6.1 'Do-Nothing' Scenario

If the Proposed Project were not to proceed, the existing wind farm will be decommissioned. Therefore, 25.3 MW of indigenous renewable energy being supplied to the national grid would be lost. The opportunity to maximise the generation capacity of Ireland's Wind Sector, at this location would be lost, along with the future opportunities to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. Employment generated through the operation and maintenance of Taurbeg Wind Farm will also be lost. Existing land use within the Proposed Offsetting Lands would continue and the Proposed Offsetting Measures would not take place.

5.6.2 Extended Operational Phase

Where impacts are envisaged on population or health as a result of both the Proposed Lifetime Extension or Proposed Offsetting Measures, these are discussed below.

5.6.2.1 Population

The effects set out below relate to the Proposed Project.

5.6.2.1.1 *Population Levels*

Proposed Lifetime Extension

Pre-Mitigation Impacts

The Proposed Lifetime Extension will have no impact on the population of the area with regards to changes to trends, population density, household size or age structure.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

No residual impacts.

Proposed Offsetting Measures

Pre-Mitigation Impacts

The Proposed Offsetting Measures will have no impact on the population of the area with regards to changes to trends, population density, household size or age structure.

Proposed Mitigation and Monitoring Measures

None Proposed

Residual Impact

No residual impacts.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.1.2 *Employment and Investment*

Proposed Lifetime Extension

Pre-Mitigation Impacts

The Proposed Lifetime Extension will present an opportunity for continued employment of the personnel involved in the maintenance and control of the existing Taurbeg Wind Farm. This will have a medium-term, imperceptible, positive effect on employment.

The injection of money in the form of rental income to the landowners associated with the Proposed Lifetime Extension has the potential to result in an increase in household spending and demand for goods and services in the local area. This will have a medium-term slight positive indirect effect.

Rates payments for the existing Taurbeg Wind Farm are currently in the region of €250,000 per annum. For the Proposed Lifetime Extension these rates payments would continue and will continue to contribute significant funds to Cork County Council, which will be redirected to the provision of public services within Co. Cork. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

The Community Benefit Fund (CBF) for the lifetime extension of the Taurbeg Wind Farm project remains at the original annual amount of €23,000, as established during the initial commissioning. Additionally, a 2% annual increase has been added to this amount. Over the 10-year operational period, the total community benefit fund will amount to €215,000.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

The continuation of employment for 2-3 maintenance workers for the 10-year extension period will have a Long Term, imperceptible positive effect on employment.

Proposed Offsetting Measures

Pre-Mitigation Impacts

The Proposed Offsetting Measures will present an opportunity to generate employment of a small number of personnel for 105.5 ha of deforestation of commercial forestry. There will also be employment generated through the ongoing monitoring proposed as part of the Proposed Offsetting Measures. This will have a long term, imperceptible, positive effect on employment.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

The employment of approximately 1-4 forestry workers for the Proposed Offsetting works will have a temporary, imperceptible, positive effect on employment. The employment generated through ongoing monitoring for the Proposed Offsetting Measures will have a long term, imperceptible positive effect on employment.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.1.3 *Land-use Patterns and Activities*

Proposed Lifetime Extension

Pre-Mitigation Impacts

The footprint of the Proposed Lifetime Extension, including turbines, roads etc., occupies only a small percentage of the total Study Area defined for the purposes of this EIAR. The main land-use of agriculture and private forestry during the operational phase will continue to co-exist with the wind farm. Therefore, the Proposed Lifetime Extension will have no impact on land use and activities.

Proposed Mitigation and Monitoring Measures

There are no mitigation and monitoring measures proposed for the Proposed Lifetime Extension.

Residual Impact

The Proposed Lifetime Extension will have no impact on other land-uses within the wider area.

Proposed Offsetting Measures

Pre-Mitigation Impacts

The Proposed Offsetting Lands are located in Knockatee and Coom, Co. Kerry with main land use consisting of commercial forestry and agricultural pastures. Farmland restoration and deforestation of commercial forestry are proposed as part of the Proposed Offsetting Measures for the benefit of hen harrier. A long term, slight positive impact on land use and activities is associated with the Proposed Offsetting Measures.

Proposed Mitigation and Monitoring Measures

Mitigation and monitoring measures proposed as part of the Proposed Offsetting Measures are discussed in Appendix 7-7.

Residual Impact

The Proposed Offsetting Measures will have a long term, slight positive effect on land use in the area.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.1.4 *Property Values*

Proposed Lifetime Extension

Pre-Mitigation Impacts

As noted in Section 5.3.10, the conclusions from available scientific literature indicate that there is insufficient evidence to determine that there is the potential for a significant effect on property values as a result of the Proposed Lifetime Extension. There is the potential for medium-term imperceptible negative impacts on property values located within 1km of the Proposed Lifetime Extension.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

It is on this basis that it can be reasonably concluded that there would be a medium-term imperceptible negative impact on property values due to the Proposed Lifetime Extension.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.1.5 *Tourism*

Proposed Lifetime Extension

Pre-Mitigation Impacts

There are no tourism attractions within or adjacent to the Site that could be impacted by the Proposed Lifetime Extension.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

Based on the literature review in Section 5.3.8, the majority of studies indicate that wind farm developments do not deter visitors to tourist attractions or scenic landscapes where turbines are visually evident. As such, it is considered that the Proposed Lifetime Extension will have a medium term-term imperceptible negative impact of visitor experience to attractions in the wider landscape.

Proposed Offsetting Measures

Pre-Mitigation Impacts

The Proposed Offsetting Lands are located in a rural setting in Knockatee and Coom, Co. Kerry. There are no tourism attractions within or adjacent to the Proposed Offsetting Lands that could be impacted by the Proposed Offsetting Measures.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

The Proposed Offsetting Measures will have a long term, imperceptible neutral effect on tourism in the area.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.1.6 *Residential Amenity*

Proposed Lifetime Extension

Pre-Mitigation Impacts

Potential impacts on residential amenity during the Proposed Lifetime Extension could arise primarily due to noise, shadow flicker or changes to visual amenity. Detailed noise and shadow flicker modelling have been carried out as part of this EIAR, which shows that the existing Taurbeg Wind Farm meets all required guideline limits in relation to noise and shadow flicker.

The visual impact of the existing Taurbeg Wind Farm is addressed in Chapter 13: Landscape and Visual. The turbine locations have been designed to maximise turbine separation distances to dwellings in the area, with no turbines located within 731m of a property. Taurbeg Wind Farm has been operational for a 19 year period and complies with the 2006 WEDGs in relation to turbine setback from

sensitive receptors i.e. a minimum 500m set back. The existing turbines also adhere to the 2019 draft WEDGs in relation to turbine setback from sensitive receptors i.e. a minimum 4 x tip height (108.2m x 4 =432.8m). Note however no update or final 2019 WEDGs were subsequently published. Medium term, slight negative effects on residential amenity are associated with the Proposed Lifetime Extension.

Mitigation and Monitoring Measures

Commissioning noise surveys will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of a wind farm being commissioned – in this instance, continuing its operation. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken.

Residual Impact

The residual effect on residential amenity is considered to be a Medium term, slight negative impact.

Proposed Offsetting Measures

Pre-Mitigation Impacts

Potential impacts on residential amenity during the Proposed Offsetting Measures could arise primarily due to noise as a result of deforestation works. However, due to the remote location of the Proposed Offsetting Lands, noise impacts are not anticipated to be significant. Temporary, imperceptible negative impacts on residential amenity are associated with the Proposed Offsetting Measures.

Proposed Mitigation and Monitoring Measures

None Proposed.

Residual Impact

The residual effect on residential amenity is considered to be a temporary, imperceptible negative impact.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.1.7 *Interference with Communication Systems*

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The alternating current, electrical generating and transformer equipment associated with wind turbines, like all electrical equipment, also generates its own electromagnetic fields, and this can interfere with broadcast communications. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, affecting, for example, radio signals. The most significant potential effect occurs where the wind farm is directly in line with the transmitter radio path. This interference can be overcome by the installation of deflectors or repeaters.

Notwithstanding the fact that this wind farm is already operational, the usual scoping and consultation process involving organisations such as regional broadcasters, and fixed and mobile phone operators was carried out as part of the scoping and consultation exercise for the Proposed Lifetime Extension. Full details are provided in Chapter 2: Background to the Proposed Project and Section 15.3 (Telecommunications and Aviation) of Chapter 15: Material Assets.

The Proposed Lifetime Extension will have no impact on telecommunications.

5.6.2.2 Health

5.6.2.2.1 *Health and Safety*

Proposed Lifetime Extension

Pre-Mitigation Impact

The Proposed Lifetime Extension will pose little threat to the health and safety of the public. The Department of the Environment, Heritage and Local Government (DoEHLG)'s '*Wind Energy Development Guidelines for Planning Authorities 2006'* state that there are no specific safety considerations in relation to the operation of wind turbines. Fencing or other restrictions are not necessary for safety considerations. People or animals can safely walk up to the base of the turbines.

The 2006 WEDGs state that there is a very remote possibility of injury to people from flying fragments of ice or from a damaged blade. However, most blades are composite structures with no bolts or separate components and the danger is therefore minimised. The build-up of ice on turbines is unlikely to present problems. The wind turbines are fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation.

The turbine blades are manufactured of wood and laminated layers of glass fibre which prevents any likelihood of an increase in lightning strikes within existing Taurbeg Wind Farm or the local area. Lightning conduction cables, encased in protection conduits, follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables are earthed adjacent to the turbine base.

The Proposed Lifetime Extension will not present a danger to the public or livestock. Rigorous safety checks have and will be conducted on the turbines during the Proposed Lifetime Extension to ensure the risks posed to staff, landowners and general public are unlikely. The Proposed Lifetime Extension will have a medium- term, slight negative effect on health and safety.

Mitigation and Monitoring Measures

Notwithstanding the above, the following mitigation measures are currently deployed at the existing Taurbeg Wind Farm to ensure that the risks posed to staff, landowners and general public remain unlikely throughout the extended operational life of the wind farm.

Access to the existing Taurbeg Wind Farm is controlled through a locked gate.

Access to the turbines is through a door at the base of the structure, which will be locked at all times outside of maintenance visits.

Signs are erected at suitable locations across the wind farm as required for the ease and safety of operation of the wind farm. These signs include:

- Buried cable route markers at regular intervals and change of cable route direction;
- Directions to relevant turbines at junctions;

- "No access to Unauthorised Personnel" at appropriate locations
- Speed limits signs at site entrance and junctions;
- "Warning these Premises are alarmed" at appropriate locations;
- "Danger HV" at appropriate locations;
- "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at site entrance;
- "No unauthorised vehicles beyond this point" at specific site entrances; and
- Other operational signage required as per site-specific hazards.

An operational phase Health and Safety Plan is active at the existing Taurbeg Wind Farm. This Plan comprehensively identifies Health and Safety issues associated with the operation of the existing Taurbeg Wind Farm and provides for access for emergency services at all times. This Health and Safety Plan is updated regularly as necessary.

The components of a wind turbine are designed to last beyond 30 years and are equipped with a number of safety devices to ensure safe operation during their lifetime. During the operation of the wind farm regular maintenance of the turbines is carried out. A task specific Health and Safety Plan has been developed for these works in accordance with the site's health and safety requirements.

Residual Impact

With the implementation of the above mitigation measures, there will be a medium-term, imperceptible, negative residual impact on health and safety during the Proposed Lifetime Extension.

Proposed Offsetting Measures

Pre-Mitigation Impacts

The Proposed Offsetting Measures will involve deforestation works and restoration of farmland. An updated health and safety risk assessment will be carried out prior to the commencement of deforestation works to ensure the risks posed to staff will be unlikely. The Proposed Offsetting Measures will have a temporary, slight negative effect on health and safety.

Proposed Mitigation and Monitoring Measures

A Health and Safety Plan and method statement will be produced by the contractor for the proposed deforestation works at the Proposed Offsetting Lands prior to the commencement of the works. The following mitigation measures will be implemented at the site:

- A site induction will take place prior to any deforestation works commencing. All contractors involved in deforestation operations will be required to attend;
- An emergency procedure and evacuation plan has been devised for the site;
- Internal roadways will be maintained and open during working times to facilitate emergency vehicles or egress in the event of an accident. All site work vehicles will park at lay byes and will not obstruct traffic on the bog roads. Traffic signs and speed limits will be obeyed at all times;
- All site personnel must wear high visibility clothing and appropriate footwear on site;
- 'Clean as you go' policy will be implemented on site. All waste materials will be removed off site by contractor on daily/regular basis;
- Each site will have an adequate first aid kit, located within each worker's vehicle;
- All accidents and dangerous occurrences will be reported to the contractor and applicant immediately;
- All fuel/chemicals and machine service points will be a minimum of 50 meters away from water courses, drains or culverts that may lead to water courses. All chemicals will be removed from the site at the end of the day;

- There will be no lone working on the site. Workers will be present on the site in a minimum of pairs. Forest manager is to be contacted prior to access and upon exit of the site.
- Site safety signage (Forestry Operations in Progress, No Public Entry and Exit & Entry points) will be erected and maintained on worksite;
- All plant, machinery and equipment will be in good working order and operators must be in possession of the relevant CSCS ticket;
- Fire extinguishers, first aid kits and pollution control kits will be available in each machine at all times;
- All accident and near misses will be reported to contractor and applicant. The works manager will complete the incident report form and record the incident in the incident reporting log.

Residual Impact

With the implementation of the above mitigation measures, there will be a temporary, slight, negative residual impact on health and safety during the deforestation works associated with the Proposed Offsetting Measures.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.2.2 *Air Quality: Dust, NO_2, PM_{10} and PM_{25} and CO2 Emissions*

Proposed Lifetime Extension

Pre-Mitigation Impact

The existing Taurbeg Wind Farm requires daily visits of maintenance staff in LGVs and infrequent generation of small volumes of hydrocarbon waste. The existing Taurbeg Wind Farm generates electricity from a renewable source, contributing to a positive impact on air quality. Over the proposed 10-year extension of the existing Taurbeg Wind Farm it will continue to effectively reduce carbon dioxide emissions that would have occurred if the same energy were generated by traditional fossil fuel plants. This is a medium-term slight positive effect on Air Quality.

Mitigation and Monitoring Measures

None Proposed.

Residual Impacts

A medium-term slight positive residual effect on Air Quality is associated with the Proposed Lifetime Extension.

Proposed Offsetting Measures

Pre-Mitigation Impact

The Proposed Offsetting Measures will result in some vehicular emissions through machinery use on-site and transport to and from the site during the works. This will have a temporary, slight negative effect on Air Quality.

Mitigation and Monitoring Measures

None Proposed.

Residual Impacts

A temporary, slight negative residual effect on Air Quality is associated with the Proposed Offsetting Measures.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.2.3 *Water Quality*

Proposed Lifetime Extension

Pre-Mitigation Impact

Some minor maintenance works may be completed during the extended operational phase, such as maintenance of site entrances, internal roads and hardstand areas. These works would be of a very minor scale and would be very infrequent. During such maintenance works there is a small risk associated with the release of hydrocarbons from site vehicles, although it is not envisaged that any significant refuelling works will be undertaken on site during the Proposed Lifetime Extension. There will be a medium-term imperceptible negative impact on human health due to water quality.

Mitigation and Monitoring Measures

A number of mitigation measures are proposed in Chapter 9 Hydrology and Hydrogeology to avoid release of hydrocarbons and site runoff, see Section 9.5.3 of Chapter 9 for full details.

Residual Impacts

With the implementation of the Proposed Lifetime Extension drainage design and mitigation measures the residual impacts are considered to be medium term, imperceptible, negative on human health due to water quality.

Proposed Offsetting Measures

Pre-Mitigation Impact

The Proposed Offsetting Measures include deforestation works, which could lead to sediment run off to watercourses nearby. There could be a potential temporary slight negative impact on human health due to a deterioration of water quality.

Mitigation and Monitoring Measures

There are no additional mitigation measures relative to drainage proposed for the Proposed Offsetting Lands. The following mitigation measures are already in place at the site and will continue to be left in place during the proposed deforestation works:

- Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff;
- Where possible, interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation; and,
- Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters.

These mitigation measures have been effective in removing any silt generated during routine maintenance works.

In addition to the above, temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock.

Residual Impacts

A temporary, slight negative residual effect on human health due to water quality is associated with the Proposed Offsetting Measures.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.2.4 *Traffic and Transport*

Proposed Lifetime Extension

Pre-Mitigation Impact

Major component failures are considered unlikely and therefore the presence of abnormal load vehicles and HGVs at the site is considered extremely rare. Should a turbine component need replacing, the measures detailed in Chapter 15 will be implemented.

All site visits for maintenance and inspection purposes for the Proposed Lifetime Extension will be done so via LGVs with just one or two LGVs per day. Visits to the site by Eirgrid/ESB for maintenance and inspection purposes will be done so via LGVs with just one or two visits per day. There will be a medium term imperceptible negative impact on local road users during the Proposed Lifetime Extension.

Mitigation and Monitoring Measures

None proposed.

Residual Impacts

Impacts on local road users during the Proposed Lifetime Extension are considered to be a medium term negative imperceptible.

Proposed Offsetting Measures

Pre-Mitigation Impact

The Proposed Offsetting Measures will generate site visits to the site. Due to the remote location of the site and small nature of the works proposed, large volumes of traffic are not expected and will be temporary for the duration of the deforestation works. There will be a temporary slight negative impact on local road users

Mitigation and Monitoring Measures

None proposed.

Residual Impacts

Residual impacts on local road users during the Proposed Offsetting Measures are considered to be a temporary, slight and negative.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.2.5 *Major Accidents and Natural Disasters*

Proposed Lifetime Extension

Pre-Mitigation Impacts

A risk register has been developed which contains all potentially relevant risks identified during the Proposed Lifetime Extension. Six risks (Severe Weather Contamination, Fire/ Gas Explosion, Collapse/ Damage to Structures, Traffic Incident, Loss of Critical Infrastructure) specific to the Proposed Lifetime Extension have been identified and are presented in Chapter 16 Major Accidents and Natural Disasters. As outlined in Section 16.4.1.4.1, the scenario with the highest risk score in terms of the occurrence of major accident and/or disaster during operation is identified as "Fire/Explosion' during operation.

Mitigation and Monitoring Measures

- The existing Taurbeg Wind Farm was designed and built in line with best practice at time of construction and, as such, mitigation against the risk of major accidents and/or disasters has been embedded through the design. In accordance with the provision of the European Commission '*Guidance on the preparation of Environmental Impact Assessment Reports'* 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures.
- Please refer to Chapter 18 Schedule of Mitigation and Monitoring Measures which details all proposed mitigation and monitoring measures for the operation and decommissioning of the existing Taurbeg Wind Farm.
- The existing Taurbeg Wind Farm is subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.

Residual Impact

The impact assessment concludes that the risk of a major accident and/or disaster during the Proposed Lifetime Extension is considered 'low' in accordance with the 'Guide to Risk Assessment in Major Emergency Management' (DoEHLG, 2010).

Proposed Offsetting Measures

Pre-Mitigation Impact

A risk register has been developed which contains all potentially relevant risks identified during the Proposed Offsetting Measures. Six risks (Severe Weather Contamination, Fire/ Gas Explosion, Collapse/ Damage to Structures, Traffic Incident, Loss of Critical Infrastructure) specific to the Proposed Offsetting Measures have been identified and are presented in Chapter 16 Major Accidents and Natural Disasters. As outlined in Section 16.4.1.6.1, the scenario with the highest risk score in terms of the occurrence of major accident and/or disaster during the works period is identified as 'Peat Stability'.

Mitigation and Monitoring Measures

None proposed.

Residual Impacts

The impact assessment concludes that the risk of a major accident and/or disaster during the Proposed Lifetime Extension is considered 'low' in accordance with the 'Guide to Risk Assessment in Major Emergency Management' (DoEHLG, 2010).

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.2.6 *Noise*

Proposed Lifetime Extension

Pre-Mitigation Impacts

An assessment of the existing background noise conditions was conducted using unattended sound level meters at three locations. These results are presented in Chapter 12 of the EIAR. A noise assessment of the operational phase of the existing Taurbeg Wind Farm has also been carried out. The predicted noise levels for the existing Taurbeg Wind Farm have been compared with the existing background noise levels and the best practice guidance levels for noise emissions from wind farms. Nearby existing operational wind turbines are at located at Knockacummer and Glentane 1 & 2 wind farms have been included in the cumulative wind turbine noise assessment.

Details of the noise assessment carried out by AWN Consulting are presented in Chapter 12 of the EIAR.

The noise assessment determined that the predicted operational noise effect at the closest noise sensitive receptors to the site is of a neutral, imperceptible and medium-term nature. It is noted that this effect considers the periods of greatest potential effect prior to mitigation, i.e., the worst-case scenario. It is noted that if the Proposed Lifetime Extension were permitted, there would be no change to the existing noise environment.

Mitigation and Monitoring Measures

If the Proposed Lifetime Extension is granted permission to continue operating, a commissioning noise survey can be carried out as detailed in Chapter 12. Should the commissioning assessment identify any exceedances of the conditioned turbine noise limits as a result of the Proposed Lifetime Extension, these exceedances will be mitigated through curtailment of turbine(s) in the relevant wind speed and wind directions. The curtailment strategy will be developed for the installed turbines to achieve the relevant noise criteria at all Sensitive Receptors.

Residual Impact

The potential worst-case effects at the nearest noise sensitive locations associated with the Proposed Lifetime Extension are neutral, imperceptible and medium-term.

Proposed Offsetting Measures

Pre-Mitigation Impacts

The predicted pre-mitigation levels of noise associated with deforestation activities are within the construction noise criterion outlined in Chapter 12, Noise and Vibration. Where the works occur at distances of greater than 50 m for the nearest sensitive receptor it is concluded that there will be no significant noise impact associated with these activities.

Mitigation and Monitoring Measures

The works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites.

Residual Impact

The predicted residual effects are predicted to be negative, not significant and temporary.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.2.3 Shadow Flicker

Proposed Lifetime Extension

Pre-Mitigation Impacts

The shadow flicker prediction model indicates that no Sensitive Receptors within the Shadow Flicker Study Area will experience daily (or annual) shadow flicker during the Proposed Lifetime Extension.

Mitigation and Monitoring Measures

None proposed.

Residual Impact

Following the shadow flicker assessment, zero shadow flicker was recorded at the 3 no. Sensitive Receptors in the Study Area. Therefore, the existing Taurbeg Wind Farm is in line with the shadow flicker duration thresholds set out in the 2006 WEDGs. Therefore, there is no residual impact. Taurbeg is also in compliance with the limit of zero shadow flicker as set out in the 2019 draft WEDGs which were never finalised.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on population levels associated with the Proposed Project.

5.6.3 Decommissioning Phase

The existing Taurbeg Wind Farm includes for the extension of lifetime of the existing wind farm for a further 10 years beyond the expiry of the current permission in 2026. Following the 10-year lifetime extension period, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the site may be decommissioned completely. All associated above-ground site infrastructure will be removed and the site returned to its former use as agricultural land.

The works likely required during the decommissioning phase are described in Section 4.7 Decommissioning of Chapter 4 of this EIAR and Appendix 4-3 Decommissioning Plan. During decommissioning, it may be possible to reverse some of the potential impacts caused during the initial construction of the wind farm by rehabilitating constructed areas such as turbine bases and hardstanding areas. This will be done by covering with local topsoil and reseeding with local native mixes to encourage vegetation growth and reduce run-off and sedimentation.

Residential amenity in the area will be protected during decommissioning by establishing channels of communication between the Applicant or contractor, Local Authorities and local residents. The hours of decommissioning works (and associated traffic movements) will, insofar as possible, be limited to avoid unsociable hours. Activities shall generally be restricted to between 07:00hrs and 19:00hrs Monday to Friday and between 07:00hrs and 13:00hrs on Saturdays, with no activities on Sundays or public holidays unless in the event of an emergency. However, to ensure that optimal use is made of good weather period or at critical periods within the programme (e.g., crane use) or to accommodate removal of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to the Local Authority and local residents.

Impacts associated with the decommissioning phases will be greater than that associated with the operational phase. The important element of decommissioning from a landscape and visual impacts perspective is the dismantling and removal of the wind turbines. This will occur for a limited period of time and thus will be 'Short-Term' and will predominately involve cranes adjacent to the turbines during the dismantling process. The control measures for noise and dust outlined in Appendix 4-3 Decommissioning Plan will ensure that the potential for impacts on human health are minimised or avoided.

5.6.4 Cumulative Effects

For the assessment of cumulative impacts, any other existing, permitted or proposed developments (wind energy or otherwise) have been considered where they have the potential to generate an in-combination or cumulative impact with the Proposed Lifetime Extension. Potential cumulative effects for the Proposed Offsetting Measures have also been considered. The factors to be considered in relation to cumulative effects include population and human health, biodiversity, land, soil, water, air,

climate, material assets, landscape, and cultural heritage as well as the interactions between these factors.

The potential cumulative impact of the Proposed Lifetime Extension and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Lifetime Extension will have on the surrounding environment when considered cumulatively and in combination with relevant approved, and existing projects in the vicinity of the site. Similarly, the potential cumulative impact of the Proposed Offsetting Measures and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Offsetting Measures will have on the surrounding environment when considered cumulatively and in combination with relevant approved, and existing projects in the vicinity of the site.

The Proposed Lifetime Extension Cumulative Study Area is 10km from the site. The Proposed Offsetting Measures Cumulative Study Area is 5km from the site.

Further information on projects considered as part of the cumulative assessment are given in Section 2.11 of Chapter 2: Background to the Project. The impacts with the potential to have cumulative effects on human beings are discussed below and in more detail in the relevant chapters: Noise (Chapter 12), Visual Impacts (Chapter 13) and Traffic (Chapter 15).

5.6.4.1 Health and Safety

5.6.4.1.1 *Proposed Lifetime Extension*

The Proposed Lifetime Extension will have no cumulative impacts in terms of health and safety. There is no credible scientific evidence to link wind turbines with adverse health impacts. All other proposed, permitted or operational/existing developments (wind energy or otherwise) would be expected to follow all relevant Health and Safety Legislation during the operation and decommissioning phases of the existing Taurbeg Wind Farm. It is assumed also that all mitigation measures in relation to the other cumulative projects will also be implemented. It is on this basis that it can be concluded that there would be a medium-term imperceptible cumulative impact from the Proposed Project and other developments in the area.

5.6.4.1.2 *Proposed Offsetting Measures*

The Proposed Offsetting Measures will have no cumulative impact in terms of health and safety. The Proposed Offsetting Measures will follow the health and safety measures outlined in Section 5.6.2.2.1 of this chapter. It is assumed that all mitigation measures in relation to the other cumulative projects will also be implemented and strictly adhered to. It is on this basis that it can be concluded that there would be a temporary, imperceptible cumulative impact from the Proposed Offsetting Measures and other projects within the area.

5.6.4.2 Employment and Economic Activity

5.6.4.2.1 *Proposed Lifetime Extension*

Wind farms within 10 kilometres of the existing Taurbeg Wind Farm which may be proposed, permitted or operational/existing contribute to short term employment during the construction stages and provide the potential for long-term employment resulting from maintenance operations.

5.6.4.2.2 *Proposed Offsetting Measures*

Projects within the Proposed Offsetting Measures Cumulative Study Area which may be proposed, permitted or operational contribute to short term employment during the construction stages and provide the potential for long-term employment resulting from operation of these projects. The

Proposed Offsetting Measures will have a positive cumulative impact in combination with other projects in the Proposed Offsetting Measures Cumulative Study Area.

5.6.4.3 Tourism and Amenity

5.6.4.3.1 *Proposed Lifetime Extension*

There are no key identified tourist attractions pertaining specifically to the Site. As mentioned previously, wind farms are an existing feature in the surrounding landscape, which will assist in the assimilation of the existing Taurbeg Wind Farm into this environment.

It is not considered that the Proposed Lifetime Extension together with other projects in the area will cumulatively affect any tourism infrastructure in the wider area. As mentioned previously, wind farms are an existing feature in the surrounding landscape, which will assist in the assimilation of the existing Taurbeg Wind Farm into this environment. As also noted in Section 5.3.9 above, the conclusions from available research indicate there is a generally positive disposition among tourists towards wind development in Ireland. It is on this basis that it can be concluded that there would be a medium-term imperceptible cumulative impact from the Proposed Lifetime Extension and other wind farm developments in the area.

5.6.4.3.2 *Proposed Offsetting Measures*

There are no key identified tourist attractions pertaining specifically to the Proposed Offsetting Lands. It is not considered that the Proposed Offsetting Measures together with other projects in the area will cumulatively affect any tourism infrastructure in the wider area.

5.6.4.4 Land-use

5.6.4.4.1 *Proposed Lifetime Extension*

Existing land-uses of coniferous forestry and agriculture will continue in conjunction with the Proposed Lifetime Extension and all other existing and permitted wind farms.

Therefore, there will be no significant cumulative impact on land-use.

5.6.4.4.2 *Proposed Offsetting Measures*

As a component of the Proposed Offsetting Measures, the land use at the Proposed Offsetting Lands will change due to restoration of farmland and deforestation works. There will be no impact on land-use cumulatively, as these land use changes pertain solely to the Proposed Offsetting Lands, and will not significantly impact land-use in the surrounding area.

5.6.4.5 Property Values

5.6.4.5.1 *Proposed Lifetime Extension*

It can be concluded that there is the potential for a medium-term imperceptible impact on property values within 1km of the existing turbines of the existing Taurbeg Wind Farm. Given that Knockacummer Wind Farm is located within 1km of the existing Taurbeg Wind Farm, it can be concluded that there is potential for cumulative effects on property values to arise.

5.6.4.5.2 *Proposed Offsetting Measures*

There is no cumulative potential for impacts on property values as a result of the Proposed Offsetting Measure in combination with other proposed projects within the Proposed Offsetting Lands within the Cumulative Study Area.

5.6.4.6 Services and Community Investment

5.6.4.6.1 *Proposed Lifetime Extension*

As detailed in Section 5.6.2.1.2, rates payments for the existing Taurbeg Wind Farm are currently in the region of €250,000 per annum. For the Proposed Lifetime Extension, it is proposed that these rates payments will continue and will continue to contribute significant funds to Cork County Council, which will be redirected to the provision of public services within Co. Cork. These services include provisions such as road upkeep, fire services, environmental protection, street lighting, footpath maintenance etc. along with other community and cultural support initiatives.

In addition, the injection of money into local services though the Community Benefit Fund is also expected to be a medium-term positive cumulative impact.

5.6.4.6.2 *Proposed Offsetting Measures*

The Proposed Offsetting measures in combination with other proposed projects within the Proposed Offsetting Measures Cumulative Study Area will not cumulatively impact services and community investment.

5.6.4.7 Shadow Flicker

5.6.4.7.1 *Proposed Lifetime Extension*

As outlined in Section 5.5, the nearest wind farm development to the existing Taurbeg Wind Farm is the existing Knockacummer Wind Farm. However, there will be no impacts from cumulative shadow flicker as there are no Sensitive Receptors located within the overlapping study areas of Knockacummer Wind Farm and Taurbeg Wind Farm.

5.6.4.8 Residential Amenity

5.6.4.8.1 *Proposed Lifetime Extension*

Cumulative impacts on residential amenity could potentially arise from impacts due to noise, traffic or visual disturbance. All mitigation as outlined in this EIAR will be implemented in order to reduce insofar as possible impacts on residential amenity at Sensitive Receptors located in the vicinity of the existing Taurbeg Wind Farm. It is assumed also that all mitigation measures in relation to the other cumulative projects will also be implemented. A cumulative list of other wind farms is presented in Chapter 2 of this EIAR. Knockacummer Wind Farm is the closest existing or permitted wind farm to the existing Taurbeg Wind Farm, located at a distance of approximately 881m between the wind farms closest turbines. Chapter 13 Landscape and Visual notes that no significant cumulative landscape or visual effected are deemed to arise from the Proposed Lifetime Extension. During the Proposed Lifetime Extension, noise from the Taurbeg Wind Farm and other nearby wind farms will be limited to below guideline levels or as committed to by the developer, resulting in a medium-term, imperceptible residual impact on residential amenity. Overall, it is deemed that no significant cumulative effects on population and human health are likely to occur as a result of the continued operation of the Taurbeg Wind Farm turbines.

5.6.4.8.2 *Proposed Offsetting Measures*

Restoration of the farmland habitat and deforestation of commercial forestry are proposed as part of the Proposed Offsetting Measures. When considering residential amenity in respect of the Proposed Offsetting Measures, there are two main potential impacts of relevance 1: Noise and 2) Visual amenity. Whilst noise prediction calculations have been conducted and impacts are quantifiable, impacts on visual amenity are more subjective. The predicted effects for both of these aspects are outlined below:

1) As outlined in Chapter 12 of this EIAR, 'Noise and Vibration', there are no significant effects anticipated as a result of the Proposed Offsetting Measures.
2) As outlined in Chapter 13 of this EIAR, 'Landscape and Visual', there will be positive, long-term, not significant effects on visual effects associated with the Proposed Offsetting Measures

Given there are no significant impacts on residential amenity associated with the Proposed Offsetting Measures, it's predicted that no significant cumulative effects on residential amenity are predicted when accounting for proposed projects within the proposed Offsetting Measures Cumulative Study Area.

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 6 - Biodiversity

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6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other plans and projects) that the Proposed Project may have on Biodiversity. Mitigation by design was applied to the finalised Proposed Project layout wherever possible to avoid impacts on Biodiversity. This chapter sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include non-avian species and habitats with national and international protection under the Wildlife Acts 1976-(as amended) and the EU Habitats Directive 92/43/EEC. **Impacts on avian receptors are considered in Chapter 7 of this EIAR.**

The full description of the Proposed Project is provided in Chapter 4 of this EIAR.

The chapter is structured as follows.

- The Introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
- A description of the Baseline Ecological Conditions and Receptor Evaluation is then provided.
- This is followed by an Assessment of Effects which are described with regard to each phase of the Proposed Project. There is no construction phase associated with the Proposed Project. In order to address the significant effect on Hen Harrier identified within Chapter 7, Proposed Offsetting Measures have been designed. Other phases of the Proposed Project include the extended operational phase (of the existing Taurbeg Wind Farm and of the Proposed Offsetting Measures), and decommissioning phase. Potential Cumulative effects in combination with other plans and projects are fully assessed.
- Proposed mitigation and best practice measures that will be implemented in full to avoid, reduce or offset the identified effects on biodiversity, flora and fauna are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed mitigation and best practice measures.
- The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references:

- Where the 'Proposed Lifetime Extension' is referred to, this relates to the continued 10-year operation of the existing Taurbeg Wind Farm from 2026. This includes all elements within the existing Taurbeg Wind Farm Site as shown in Figure 1-2 (Chapter 1 of this EIAR).
- Where 'the Site' is referred to, this relates to the primary study area for the Proposed Lifetime Extension, as delineated by the EIAR Site Boundary in green and encompasses an area of approximately 112 hectares (ha) as shown on Figure 1-2 (Chapter 1 of this EIAR).
- Where the 'Proposed Offsetting Measures' is referred to, this relates all works associated with the creation of new habitat in the townlands of Knockatee and Coom, Co. Kerry for the purposes of offsetting the potential significant adverse effects on hen harrier due to the continued operation of Taurbeg Wind Farm.
- Where the 'Proposed Offsetting Lands' are referred to, this relates to the lands in which the Proposed Offsetting Measures will take place, encompassing an area of approximately 123.2 hectares (ha).

- Where the 'Proposed Project' is referred to, this relates to the Proposed Lifetime Extension and the Proposed Offsetting Measures. The Proposed Project is described in detail in Chapter 4: Description of the Proposed Project of this EIAR.

6.2 Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, (as amended), is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. NHAs are legally protected from damage from the date they are formally proposed for designation[1]. A list of pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future.

The Flora (Protection) Order 2022 (S.I. No. 235) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order it is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

Irelands 4th National Biodiversity Action Plan 2023-2030 (Department of Housing, Local Government and Heritage, 2024) (the "NBAP") strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. It demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations and will implement this through a number of key targets, actions and objectives.

The Wildlife (Amendment) Act 2023 introduced a new public sector duty on biodiversity. The legislation provides that every public body, as listed in the Act, is obliged to have regard to the objectives and targets in the NBAP. The NBAP sets out five key objectives as follows:

- Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity. Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.
- Objective 2: Meet Urgent Conservation and Restoration Needs. Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.

[1] https://www.npws.ie/protected-sites/nha (accessed February 2025).

- Objective 3: Secure Nature's Contribution to People. Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.
- Objective 4: Enhance the Evidence Base for Action on Biodiversity. This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.
- Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives. Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.

In addition, the National Biodiversity Data Centre published guidance on Pollinator-friendly management of Wind Farms[2]. This identifies an evidence-based action plan for wind farm operators that can help pollinators by employing changes to existing management strategies.

Such policies have informed the evaluation of ecological receptors recorded within the Site and the ecological assessment process.

European Legislation

Habitats and species of European importance are provided legal protection under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/EC (the Birds Directive) this legislation forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites (hereafter referred to as European sites[3]) and the strict system of species protection. Both the Habitats and Bird Directives have been transposed into Irish law by Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011).

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed in both Annex II and Annex IV.

The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this chapter.

The Birds Directive instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended

[2] https://pollinators.ie/wp-content/uploads/2022/12/Wind-Farm-Pollinator-Guidelines-2022-WEB.pdf *(accessed January 2024).*
[3] *The term Natura 2000 network was replaced by 'European site' under the EU (Environmental Impact Assessment and Habitats) Regulations 2011 S.I. No. 473 of 2011.*

several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the Proposed Project having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs[4],, SPAs or cSPAs) has been carried out in the Appropriate Assessment Screening Report (AASR) and Natura Impact Statement (NIS). A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

In addition to the above, the following legislation applies with respect to habitats, fauna, invasive species and water quality in Ireland and has been considered in the preparation of this chapter:

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).
- The following legislation applies with respect to non-native species - Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

[4] *Candidate SAC (cSAC) are afforded the same protection as SACs. The process of making cSAC into SACs by means of Statutory instrument has begun and while the process if ongoing the term SAC will be used to conform with nomenclature used in the National Parks and Wildlife Services (NPWS) databased. The name applies to candidate SPAs.*

6.3 Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA) *'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2* (NRA, 2009a) and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009b). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018), were consulted in the preparation of this document to provide the scope, structure and content of the assessment.

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 of the EIAR.

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- Cork County Development Plan 2022–2028
- Kerry County Development Plan 2022-2028
- Southern Regional Assembly Regional Spatial and Economic 2020-2040 Strategy (RSES)
- National Planning Framework. Ireland 2040 Our Plan.
- National Development Plan 2021-2030.
- Ireland's 4th National Biodiversity Action Plan 2023-2030.

6.3.1 Statement of Authority

This EIAR chapter has been prepared by Aran von der Geest Moroney (B.Sc. Ecology) and Kieran Sugrue (B.Sc. Zoology) and reviewed by Pat Roberts (B.Sc. Env., MCIEEM).

Pat is Principal Ecologist at MKO with over 20 years' professional consultancy experience, Aran is a Senior Ecologist at MKO and Kieran is an Ecologist with MKO. Aran, Kieran and Pat have extensive experience in undertaking ecological surveys and impact assessments for large scale infrastructural projects such as wind farms, railways, roads and flood relief schemes.

The baseline ecological surveys were undertaken across multiple dates in 2024 and 2025 by MKO ecologists Aran von der Geest Moroney, Kieran Sugrue, Bronagh Boylan (B.Sc. Env), Rachel Walsh (B.Sc. Env), and Tim O'Ceallaigh (B.Sc.). All surveyors have the necessary skills, experience and training required to carry out the ecological field surveys.

Bat ecologists Nora Szijarto (B.Sc., M.Sc.), Sara Fissolo (B.Sc.), Stephanie Corkery (B.Sc., M.Sc.) and Cuan Feely (B.Sc., M.Sc.) conducted specific bat surveys within the Site in 2024. The Bat Report has been prepared by Nora and reviewed by Sara, Project Ecologist with MKO.

Aquatic surveys were conducted by Triturus Environmental Ltd in July 2024.

Detailed results of the bat and aquatic surveys are included within the Bat Report and Aquatic Baseline Report, see Appendix 6-1 & Appendix 6-2.

All surveyors have relevant academic qualifications and are competent in undertaking the ecological surveys with which they were involved.

6.4 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the Proposed Project and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

6.4.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

- Review of NPWS Article 17 maps 2019, 2013 and 2007.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS)[5], EPA maps[6], Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI)[7].
- Inland Fisheries Ireland (IFI) Reports, where available.
- Data on potential occurrence of rare plant and bryophytes – as per NPWS online map viewers; Flora Protection Order 2022 Map Viewer[8].
- A data request was sent to the National Parks and Wildlife Service, scientific data unit. The feedback is provided in Section 6.5.1.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Potential for in-combination effects have been considered in Chapter 2 of this EIAR and Section 6.8 of this Chapter. This was informed by a review of the EIARs/NISs prepared for other plans and projects occurring in the wider area.

6.4.1.1 Designated Sites

6.4.1.1.1 *Identification of the Designated Sites within the Likely Zone of Influence (ZOI) of the Proposed Project*

The potential for the Proposed Project to impact on sites that are designated for nature conservation was considered in this Biodiversity Chapter.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AASR and NIS that accompany this application. As per EPA Guidance (EPA, 2022), "*a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement*" but should "*incorporate their key findings as available and appropriate*". Section 6.7.5 of this chapter provides a summary of the key assessment findings with regard to European Designated Sites.

NHAs are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this Biodiversity Chapter.

[5] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba
[6] https://gis.epa.ie/EPAMaps/
[7] https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb2991184842b7ef025
[8] https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e

pNHAs were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this Biodiversity Chapter.

The following methodology was used to establish which sites that are designated for nature conservation have the potential to be impacted by the Proposed Project:

- A study was undertaken to identify any designated sites that could be significantly affected by the Proposed Project.
- The designation features of these sites, as per the NPWS website (www.npws.ie), were reviewed at the time of preparing this report.
- Where potential pathways for Likely Significant Effect are identified, the site is included within the Likely Zone of Influence (ZoI) and further assessment is required.

6.4.1.2 NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets was carried out as part of this assessment.

6.4.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.10 of this EIAR.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. If further responses are received, the comments of the consultees will be considered in the Proposed Project in the event of a grant of planning permission. The recommendation of the consultees has informed the project design and scope of assessments undertaken and the contents of the EIAR.

Table 6-1 below provides a list of the organisations consulted with regard to biodiversity during the scoping process and their response. All scoping responses are available in Appendix 2-1 and had been reviewed and taken into account in the assessment.

Table 6-1 Organisations consulted with regard to biodiversity

Consultee Name	Scoping Reply
An Taisce	No response
Bat Conservation Ireland	No response
BirdWatch Ireland	16.02.2024
Butterfly Conservation Ireland (BCI)	No response
Cork County Council-Environment	01.03.2024
Department of Agriculture, Food and the Marine	14.03.2024
Department of Communications, Climate Action and the Environment	No response
Department of Housing, Local Government and Heritage	16.02.2024
Environmental Protection Agency	No response
Forest Service	14.03.2024
Geological Survey of Ireland	06.03.2024
Inland Fisheries Ireland	No response
Irish Peatland Conservation Council	No response
Irish Red Grouse Conservation trust	No response
Irish Raptor Study Group	No response
Irish Wildlife Trust	21.02.2024
Office of Public Works	No response
The Heritage Council	No response
Transport Infrastructure Ireland	01.03.2024

Consultee Name	Scoping Reply
Uisce Éireann	07.03.2024
Waterways Ireland	15.02.2024

6.4.3 Field Surveys

A comprehensive survey of the biodiversity within the Proposed Project was undertaken to inform this Biodiversity Chapter of the EIAR. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies and guidance followed.
Surveys of the Site were carried out between February 2024 and October 2024 and are summarised in Table 6-2 below. Surveys of the Proposed Offsetting Lands were undertaken in October 2024 and January 2025 and are summarised in
Table *6-2* below.

Table 6-2. Ecology Surveys Informing the EIAR

Survey Area	Survey Type	Dates	Appendix
The Site	Mammal survey (including otter, badger)	• 22nd February 2024	N/A
	Multi-disciplinary walkover surveys (incl. Habitats)	• 2nd July 2024	N/A
	Bat Surveys	• Bat Habitat Suitability Appraisal: 14th March 2024 • Daytime Roost Inspections: March – October 2024 inclusive • Manual Activity Surveys: 15th May 2024, 25th June 2024, 29th August 2024	Bat Report, Appendix 6-1
	Aquatic surveys (including otter)	• 15th July 2024 • 16th July 2024 • 17th July 2024	Aquatics Baseline Report, Appendix 6-2
Proposed Offsetting Lands	Multi-disciplinary walkover (incl. Mammals, Habitats, Aquatic Surveys)	• 21st October 2024 • 20th January 2025 • 21st January 2025 • 22nd January 2025	N/A

6.4.3.1 Multi-disciplinary Walkover Surveys

Multidisciplinary walkover surveys were undertaken within the Proposed Project (Site and Proposed Offsetting Lands). Habitat surveys of the Site were undertaken within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). Habitat surveys of the Proposed Offsetting Lands were undertaken in October and January; however, all habitats were readily identifiable at the time of survey. A comprehensive walkover of the Site and Proposed Offsetting Lands was completed with incidental records also incorporated from other dedicated species/habitat specific surveys. During the multidisciplinary surveys, a search was conducted for Invasive Alien Species (IAS) listed on the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024) and Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011).

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for mammal signs (bats, badger, red squirrel etc.) and

areas of suitable habitat to support these species, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur in the vicinity of the Site and Proposed Offsetting Lands (e.g. otter etc.). Bird species observed during the multi-disciplinary surveys were also recorded.

The multi-disciplinary walkover surveys comprehensively covered the entire Proposed Project area. Further detailed targeted surveys were carried out for features and locations of ecological significance. Other targeted surveys undertaken within the Site and the Proposed Offsetting Lands are described in the following subsections.

All habitats recorded on the Site and the Proposed Offsetting Lands described in this Biodiversity chapter have been classified in accordance with Fossitt (2000).

The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and interpretation documents:

- Commission of the European Communities (2013) Interpretation manual of European Union habitats. Eur 27. European Commission DG Environment.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013), The Irish semi-natural grasslands survey 2007-2012. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
- Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010).

Habitats considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive where present were identified and classified as Key Ecological Receptors (KERs).

During the multidisciplinary walkover survey, any suitable habitat for Marsh Fritillary (*Euphydryas aurinia*) was noted (in line with TII guidance (NRA, 2009)).

During the multi-disciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

6.4.3.2 Terrestrial Fauna Surveys

The results of the desk study, scoping replies and incidental records of protected species recorded during multidisciplinary walkover surveys were all used to inform the scope of targeted ecological surveys required. Based on these findings dedicated surveys for bats, otter and badger were undertaken at the times set out below following the methodologies also provided below. During the multidisciplinary walkover surveys, records of invertebrates including butterflies, damselflies, dragonflies, moths, beetles etc. were recorded. Following the completion of ecological walkover surveys, no requirement for additional dedicated faunal surveys was identified.

6.4.3.2.1 *Badger Survey*

The badger surveys adhered to best practice guidance (NRA, 2009b) and CIEEM best practice competencies for species surveys[9]. Areas identified as providing potential habitat for badger within the Site were subject to specialist targeted survey. Areas identified as providing potential habitat for badger within the Proposed Offsetting Lands were surveyed during multi-disciplinary walkover surveys. Badger surveys aimed to determine the presence or absence of badger within Site and Proposed Offsetting Lands. This involved a search for all potential badger signs (latrines, badger prints, mammal tracks and setts). The badger survey was not constrained by vegetation given the nature of the habitats within the Site and Proposed Offsetting Lands and the timing of the surveys.

6.4.3.2.2 Bats

A detailed description of the survey methodologies undertaken in relation to bats is provided in Section 3 of the Bat Report included in Appendix 6-1 of this EIAR, together with full details of the survey times and the surveyors who carried out the bat survey and assessment work. Survey design and effort in 2024 was fully in accordance with the best practice guidelines available. Surveys were undertaken in strict accordance with those prescribed in NatureScot (2021) '*Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*'. This is in line with standard best practice industry guidelines.

6.4.3.3 Aquatic surveys

The Site

Aquatic surveys were conducted on the 15th, 16th and 17th July 2024 by Triturus. Survey effort focused on both instream and riparian habitats at each aquatic sampling location and included an otter survey, a fisheries assessment (electro-fishing and fisheries habitat appraisal), white-clawed crayfish survey, macrophyte and aquatic bryophyte survey and biological water quality sampling (Q-sampling) (Figure 2.1, Appendix 6-2). This holistic approach informed the overall aquatic ecological evaluation of each site/watercourse in context of the Proposed Lifetime Extension and ensured that any habitats and species of high conservation value would be detected to best inform mitigation. Full details of all dedicated aquatic survey methodologies for the Proposed Lifetime Extension are provided in Section 2 of Appendix 6-2.

In addition, aquatic habitats and potential for watercourses within the Site to support aquatic species were assessed during the multi-disciplinary walkover surveys carried out by MKO.

An otter survey of watercourses flowing within the Site were conducted by MKO on the 22nd February 2024, adhering to best practice guidance (NRA, 2009b) and CIEEM best practice competencies for species surveys[10]. All watercourses within and immediately adjacent to the Site were identified as providing potential habitat for otter and were subject to targeted surveys for this species. This involved a search for all otter signs (e.g. spraints, scat, prints, slides, trails, couches and holts) within 150m of each survey site. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009).

The Proposed Offsetting Lands

Aquatic habitats and potential for watercourses within the Proposed Offsetting Lands to support aquatic species were assessed during the multi-disciplinary walkover surveys carried out by MKO. Following initial site visits, habitat suitability for protected aquatic species of conservation interest, known or suspected to occur within/ downstream of the Proposed Offsetting Lands boundary (e.g. fish species, otter), were conducted in January 2025. Survey design and methodologies were derived from current

[9] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey: Badger, Online, Available at: https://cieem.net/wp-content/uploads/2019/02/CSS-BADGER-April-2013.pdf*
[10] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey: Otter, Online, Available at: https://cieem.net/wp-content/uploads/2019/02/CSS-EURASIAN-OTTER-April-2013.pdf*

ecological best practice guidance documents (EA, 2003; NRA, 2009b; Maitland, 2003; O'Grady, 2006; CIEEM, 2013).

Macroinvertebrate surveys to determine biological water quality were carried out in watercourses within and adjacent to the Proposed Offsetting Lands. The methodology followed was the same as that used by the EPA for their national water sampling regime (Toner *et al.* 2005). A two-minute kick sample was collected from a stream bed area of approximately one square metre with a standard handnet (250 mm x 250 mm, with a 300 mm bag depth and a 1 mm mesh size). One minute hand searches, of large objects such as tree branches or stones, was undertaken prior to each of the kick samples. The kick sampling time was then divided proportionally among the habitats present in the area, such as fast-moving riffles, shallow water, and silted banks. Samples were sorted on site with identified species classed into groups according to their pollution tolerance levels, as per Environmental Protection Agency (EPA) practice (Toner et al., 2005). Specimens were identified using the FBA Guide to Freshwater Invertebrates (Dobson *et al.*, 2012).

6.4.4 Methodology for Assessment of Impacts and Effects

6.4.4.1 Identification of Target Receptors and Key Ecological Receptors

The criteria used to assess the ecological value and significance of the study area for habitats and species present follows Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009a) and Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018).

6.4.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the Site and Proposed Offsetting Lands was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the *Guidelines for Assessment of Ecological Impacts of National Roads Schemes* (NRA, 2009a). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC, cSAC, SPA or cSPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

In accordance with these guidelines impact assessment is only undertaken of Key Ecological Receptors (KERs). KERs are within the ZoI of the Proposed Project and are 'both of sufficient value to be material in decision making and likely to be affected significantly'. To qualify as KERs, features must be of Local Ecological Importance (Higher Value) or higher. Features valued at Local Ecological

Importance (Lower Value) are not considered to be KERs and therefore not subject to impact assessment. This is not to say that they are of no biodiversity value, but that impacts on these habitat types in their local context are not likely to result in a significant effect on biodiversity. It should be noted that this relates to the impact on the habitat itself as distinct from considering the role these habitat types play in supporting KER fauna species.

6.4.4.3 Characterisation of Impacts and Effects

The Proposed Project will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM '*Guidelines for Ecological Impact Assessment in the UK and Ireland*' (2018). This chapter has also been prepared in accordance with the corresponding EPA Guidelines (EPA 2022) as detailed in Chapter 1. The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- Positive or Negative. Assessment of whether the Proposed Project results in a positive or negative effect on the ecological receptor.
- Extent. Description of the spatial area over which the effect has the potential to occur.
- Magnitude. Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- Duration is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- Frequency and Timing. This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- Reversibility. This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

6.4.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Project are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of geographic scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed
- There will be an effect on the nature, extent, structure and function of important ecological features
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

Integrity

In the context of EcIA, 'integrity' refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued (NRA, 2009a). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

- Its natural range, and areas it covers within that range, are stable or increasing.
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable.

The conservation of a species is favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats.
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future.
- There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

6.4.4.5 Incorporation of Mitigation

Section 6.7 of this Biodiversity chapter assesses the potential effects of the Proposed Project to ensure that all effects on KERs are adequately addressed. Where significant effects on KERs are predicted, mitigation is incorporated into the project design or layout to address such impacts. The mitigation measures prescribed are designed to avoid, reduce or offset any potential significant effects and ensure no significant residual effects.

6.4.4.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys undertaken across 2024 and 2025. It provides an accurate prediction of the likely ecological effects of the Proposed Project and prescribes best practice and mitigation as necessary.

The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

The habitats and species on the Site and Proposed Offsetting Lands were readily identifiable and comprehensive assessments were made during the field visits.

No significant limitations in the scope, scale or context of the assessment have been identified.

6.5 Establishing the Ecological Baseline

6.5.1 Desk Study

The following sections describe the findings of the desk study. It provides a baseline of the ecology known to occur in the existing environment based on data sources reviewed to inform the ecological impact assessment as outlined in Section 6.4.1.

6.5.1.1 Designated Sites

Table 6-3 provides details of all relevant European and Nationally designated sites initially considered to potentially be within the ZoI of the Proposed Project. All relevant European Designated Sites are fully described and assessed in the NIS and associated volumes associated with this project. In summary, three European sites were identified within the Likely Zone of Influence.

- Lower River Shannon SAC [002165]
- Blackwater River (Cork/Waterford) SAC [002170]
- Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161]

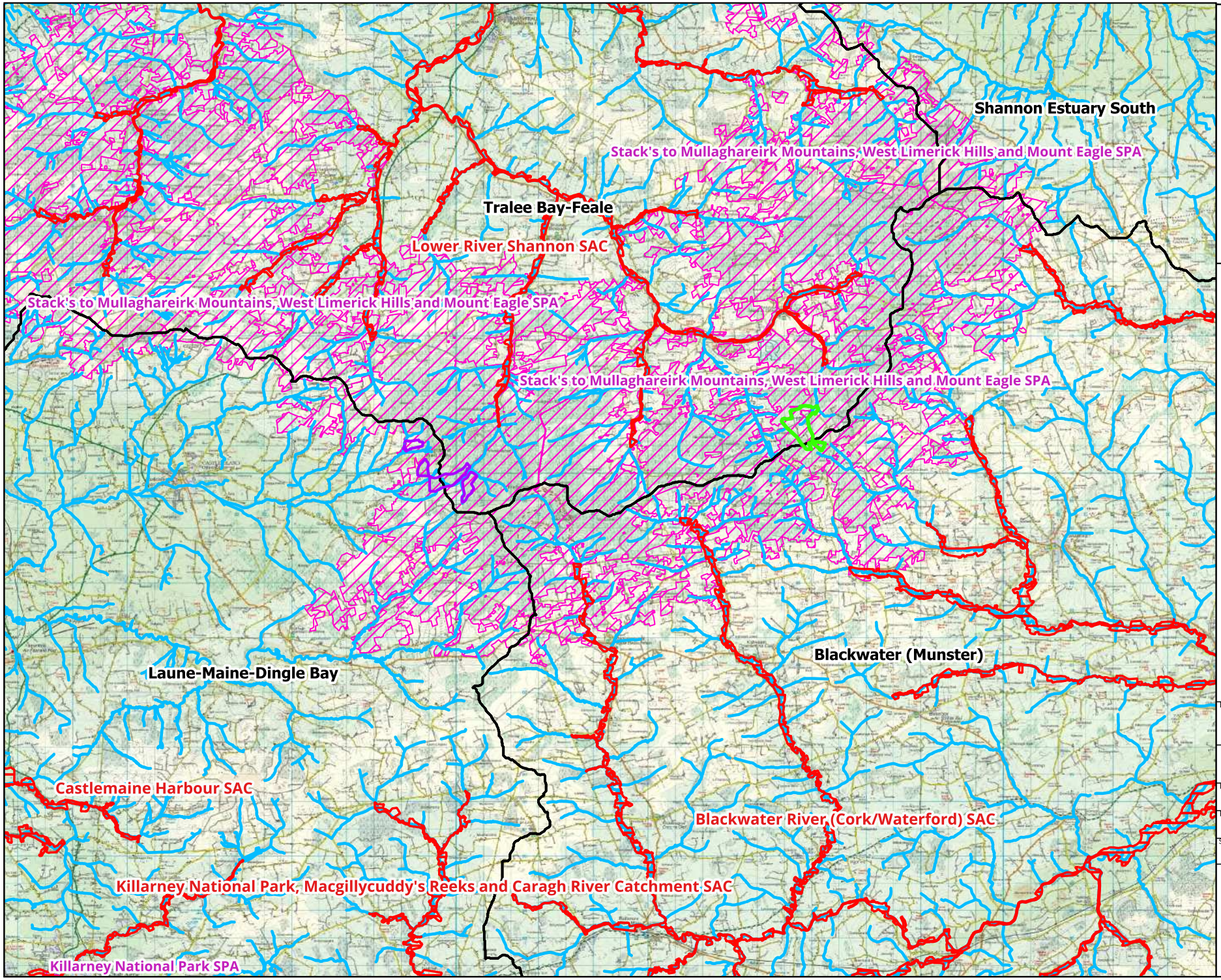
Due to the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161] being of Ornithological interest, within this EIAR, further consideration of effects on this SPA are contained within Chapter 7 Ornithology and are not included further in Chapter 6 Biodiversity.

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this Biodiversity Chapter.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this Biodiversity Chapter.

All Nationally Designated Sites as outlined above, and relevant Ramsar sites are fully described and assessed within Table 6-4 below.

A map of all the European Sites within the vicinity of the Proposed Project is provided in Figure 6-1 with all Nationally Designated Sites shown in Figure 6-2.



Map Legend

- Taurbeg EIAR Site Boundary
- Proposed Offsetting Lands
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- WFD Hydrological Catchments
- WFD River Waterbodies

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Drawing Title
The Proposed Project in relation to European Designated Sites

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NR	AvdGM
Project No.	Drawing No.
231030	Figure 6-1
Scale	Date
1:180,000	02.07.2025

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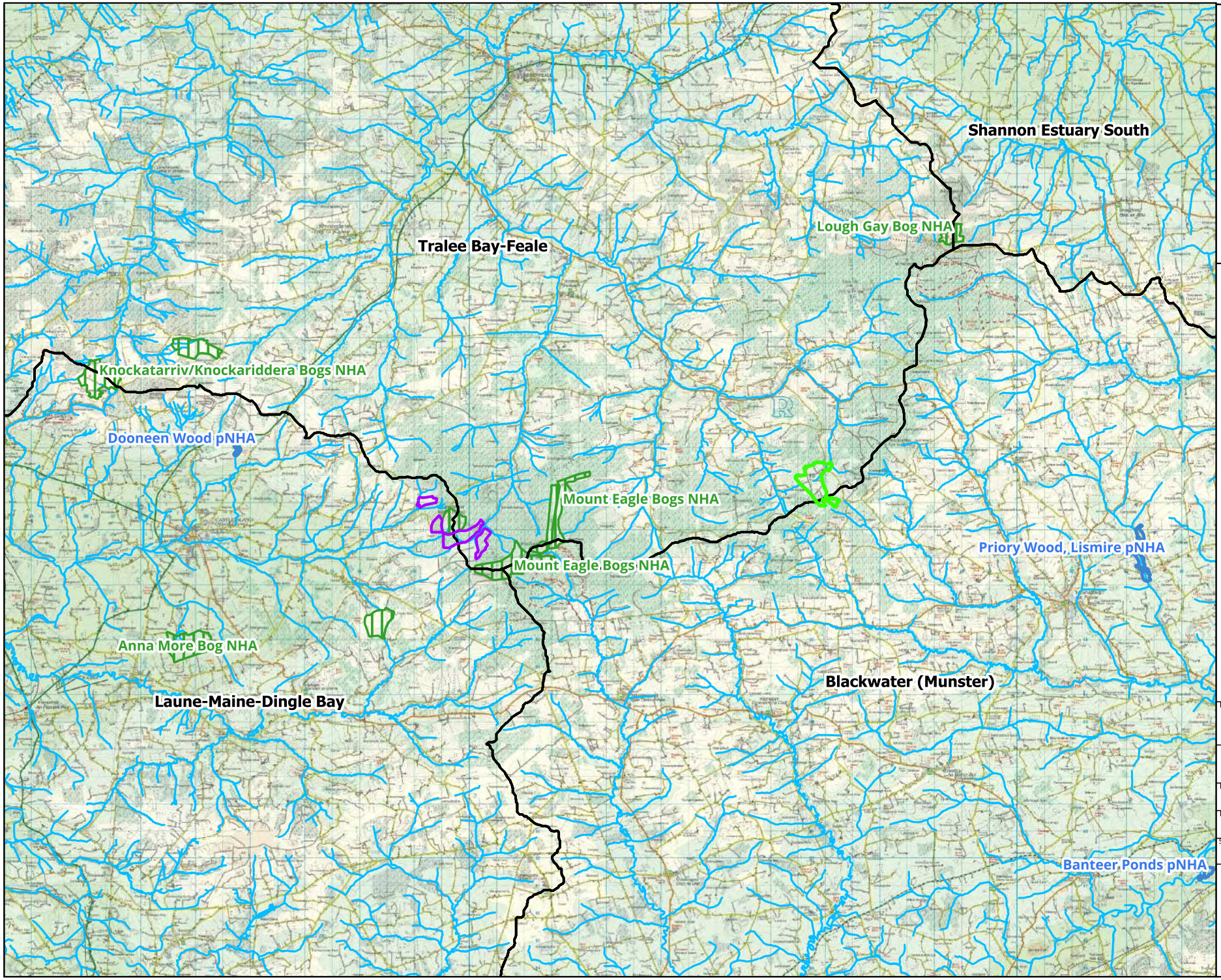

Map Legend

- Taurbeg EIAR Site Boundary
- Proposed Offsetting Lands
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- WFD Hydrological Catchments
- WFD River Waterbodies

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Drawing Title	The Proposed Project in relation to Nationally Designated Sites
Project Title	Taurbeg Wind Farm Extension of Operational Life
Drawn By: NR	Checked By: AvdGM
Project No.: 231030	Drawing No.: Figure 6-2
Scale: 1:180,000	Date: 02.07.2025

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Table 6-3 Assessment of designated sites in the Zone of Influence

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
Natural Heritage Areas (NHA)			
Mount Eagle Bogs NHA [002449]	**Distance to the Site:** › 7.5km straight line distance › No hydrological connectivity **Distance to the Proposed Offsetting Lands:** › 0m straight line distance › No downstream hydrological connectivity	**The Site:** The Site is located entirely outside the NHA boundary. Due to the intervening distance between the Site and the NHA (7.5km), and the terrestrial nature of the peatland habitats for which they are designated, no potential pathway for likely significant direct or indirect effect was identified as a result of the proposed continued operation of the existing Taurbeg Wind Farm. In addition, there is no downstream hydrological connectivity between the Site and the NHA, and all groundwater bodies which the Site and the NHA share have short flow paths between 30-300m (GSI.ie). Given the distance between the Site and the NHA (7.5km), and the lack of connectivity, there is no potential for likely significant effect on the NHA as a result of the proposed continued operation of the existing Taurbeg Wind Farm. **The Proposed Offsetting Lands:** The NHA boundary slightly overlaps with the Proposed Offsetting Lands and is located adjacent to it. The habitats present within the overlap consist of conifer plantation, recolonising bare ground and drainage ditches. None of the peatland habitats for which the NHA is designated are present within the overlap area with the Proposed Offsetting Lands. Therefore, there is no potential for direct negative effect on the terrestrial peatland habitats of the NHA. The removal of conifer plantation forestry from the vicinity of the NHA and from within the boundary of the NHA has the potential to benefit the peatland habitats of the NHA by reducing the local source of conifer seedlings that may naturally colonise the NHA. The peatland habitats of the portion of the NHA adjacent to the Proposed Offsetting Lands are located on a hill at a higher elevation to the Proposed Offsetting Lands, with the edges of the hill cut vertically to the edges of the recolonising trackways which make up the boundary, therefore, due to the physical separation between the upgradient peatland habitats of the NHA and the Proposed Offsetting Lands, and the distance between the remainder of the NHA from the Proposed Offsetting Lands, no potential for likely significant effect on the NHAs hydrogeological regime exists.	**Yes**

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
		As described in section 6.6.3 of this Biodiversity Chapter, the third schedule invasive alien plant species Rhododendron ponticum was identified growing within Areas 1, 2 and 4 of the Proposed Offsetting Lands. Deforestation activities without proper cognisance of the presence of rhododendron have the potential to create habitat suitable for the accelerated proliferation of the invasive species which could increase the potential for colonisation of the NHA habitats by *rhododendron*. Therefore, taking a precautionary approach, there exists the potential for likely significant effect on the habitats of the NHA via increased potential for colonisation by invasive species. In the absence of any Proposed Offsetting Measures the stands of rhododendron have the potential to spread naturally towards the NHA. **A complete source pathway receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this Nationally Designated Site. Therefore, the Nationally Designated Site is located within the Likely Zone of Influence and is considered further in this assessment.**	
Lough Gay Bog NHA [002454]	Distance to the Site: › 8.6km straight line distance › No hydrological connectivity Distance to the Proposed Offsetting Lands: › 19.5km straight line distance › No hydrological connectivity	There is no potential for direct effects as the Site and Proposed Offsetting Lands are located entirely outside of this designated site. Due to the intervening distances between the Site and Proposed Offsetting Lands and the Lough Gay Bog NHA, and the predominantly terrestrial nature of the peatland habitats for which the NHA is designated, no potential pathway for likely significant indirect effect was identified. Due to the lack of connectivity between both the Site and the Proposed Offsetting Lands, and the NHA, no complete source-pathway-receptor chain exists. **No pathway for effect on this Nationally Designated Site exists and the NHA is not within the Likely Zone of Influence. It is concluded, on the basis of objective information, that the Proposed Project, individually or in combination with other plans or projects, will not have a significant effect on this Nationally Designated site.**	No

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
Knockatarriv/Knockariddera Bogs NHA [002448]	**Distance to the Site:** › 9km straight line distance › No hydrological connectivity Distance to the Proposed Offsetting Lands: › 8.9km straight line distance › No hydrological connectivity	There is no potential for direct effects as the Site and Proposed Offsetting Lands are located entirely outside of this designated site. Due to the intervening distances between the Site and Proposed Offsetting Lands and the Knockatarriv/ Knockariddera Bogs NHA, and the predominantly terrestrial nature of the peatland habitats for which the NHA is designated, no potential pathway for likely significant indirect effect was identified. Due to the lack of connectivity between both the Site and the Proposed Offsetting Lands, and the NHA, no complete source-pathway-receptor chain exists. **No pathway for effect on this Nationally Designated Site exists and the NHA is not within the Likely Zone of Influence. It is concluded, on the basis of objective information, that the Proposed Project, individually or in combination with other plans or projects, will not have a significant effect on this Nationally Designated site.**	No
Anna More Bog NHA [000333]	**Distance to the Site:** › 21.4km straight line distance › No hydrological connectivity **Distance to the Proposed Offsetting Lands:** › 8.9km straight line distance	There is no potential for direct effects as the Site and Proposed Offsetting Lands are located entirely outside of this designated site. Due to the intervening distance between the Site and Proposed Offsetting Lands and the Anna More Bog NHA, and the predominantly terrestrial nature of the peatland habitats for which the NHA is designated, no potential pathway for likely significant indirect effect was identified. Due to the lack of connectivity between both the Site and the Proposed Offsetting Lands, and the NHA, no complete source-pathway-receptor chain exists. **No pathway for effect on this Nationally Designated Site exists and the NHA is not within the Likely Zone of Influence. It is concluded, on the basis of objective information, that the Proposed Project, individually or in combination with other plans or projects, will not have a significant effect on this Nationally Designated site.**	No

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
	› No hydrological connectivity		
Proposed Natural Heritage Areas (pNHA)			
Priory Wood, Lismire pNHA [001072]	**Distance to the Site:** › 10.9km straight line distance › No hydrological connectivity **Distance to the Proposed Offsetting Lands:** › 23.5km straight line distance › No hydrological connectivity	There is no potential for direct effects as the Site and Proposed Offsetting Lands are located entirely outside of this pNHA. Due to the intervening distances between the Site and Proposed Offsetting Lands and the Priory Wood, Lismire pNHA, and the predominantly terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified. Due to the lack of connectivity between both the Site and the Proposed Offsetting Lands, and the pNHA, no complete source-pathway-receptor chain exists. **This pNHA is not within the Likely Zone of Influence and no further assessment is required.**	No
Dooneen Wood pNHA [001349]	**Distance to the Site:** › 20.3km straight line distance › No hydrological connectivity	There is no potential for direct effects as the Site and Proposed Offsetting Lands are located entirely outside of this pNHA. Due to the intervening distances between the Site and Proposed Offsetting Lands and the Dooneen Wood pNHA, and the predominantly terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified. Due to the lack of connectivity between both the Site and the Proposed Offsetting Lands, and the pNHA, no complete source-pathway-receptor chain exists.	No

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
	Distance to the Proposed Offsetting Lands: › 6.7km straight line distnace › No hydrological connectivity	**This pNHA is not within the Likely Zone of Influence and no further assessment is required.**	
Castlemaine Harbour pNHA [000343]	**Distance to the Site:** › 41.1km straight line distance › No hydrological connectivity **Distance to the Proposed Offsetting Lands:** › 27.6km straight line distance › Approx. 33.6km hydrological	The Site and Proposed Offsetting Lands are located completely outside of the pNHA boundary, therefore, there is no potential for direct effect. Indirect effects on the terrestrial habitats/species of the Castlemaine Harbour pNHA can be ruled out due to the terrestrial nature of the habitats/species, the distances from the pNHA to the Site and Proposed Offsetting Lands, and the absence of a complete source-pathway-receptor chain for effect. The Site is located within a separate hydrological catchment and groundwater body to the pNHA. Therefore, no source-pathway-receptor chain for likely significant effect exists between the Site and the pNHA. The Proposed Offsetting Lands are located approximately 33.6km upstream of the pNHA. While there exists hydrological connectivity between the Proposed Offsetting Lands and the pNHA, due to the large separation distance, assimilative capacity of the intervening waters and nature of the Proposed Offsetting Measures comprised primarily of conifer deforestation, there is no potential for likely significant effect as a result of the Proposed Offsetting Measures. There is no potential for likely significant effects upon the coastal/marine habitats/ species of this pNHA due to; the estuarine/ coastal nature of the habitats, and the significant intervening hydrological distance between the Proposed Offsetting Lands and the coastal/ estuarine habitats of the pNHA. **This pNHA is not within the Likely Zone of Influence and no further assessment is required.**	No

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
Cashen River Estuary pNHA [001340]	**Distance to the Site:** › 37.2km straight line distance › 61.6km hydrological connectivity **Distance to the Proposed Offsetting Lands:** › 27.5km straight line distance › 56.5km hydrological connectivity	The Site and Proposed Offsetting Lands are located completely outside of the pNHA boundary, therefore, there is no potential for direct effect. Indirect effects on the terrestrial habitats/species of the Cashen River Estuary pNHA can be ruled out due to the terrestrial nature of the habitats/species, the distance from pNHA to the Site and Proposed Offsetting Lands, and the absence of a complete source-pathway-receptor chain for effect. The Site is located approximately 61.6km upstream of the pNHA and the Proposed Offsetting Lands are located approximately 56.5km upstream of the pNHA. There exists hydrological connectivity between the Proposed Offsetting Lands & the Site, and the pNHA. However, due to the large separation distances, assimilative capacity of the intervening waters, estuarine/ coastal nature of the habitats/ species of the pNHA, and nature of the Proposed Project, there is no potential for likely significant indirect effect on the pNHA as a result of the continued operation of the existing Taurbeg Wind Farm or the Proposed Offsetting Measures. **This pNHA is not within the Likely Zone of Influence and no further assessment is required.**	No
Ramsar Sites			
Castlemaine Harbour (Site Number: 470)	**Distance to the Site:** › Approx. 46.1km straight line distance › No hydrological connectivity	The Site and **Proposed Offsetting Lands** are located completely outside of the Ramsar Site, therefore, there is no potential for direct effect. The Site is located within a separate hydrological catchment and groundwater body to the Ramsar Site. Therefore, no source-pathway-receptor chain for likely significant effect exists between the Site and the Ramsar Site. The **Proposed Offsetting Lands** are located approximately 41.5km upstream of the Ramsar Site. While there exists hydrological connectivity between the **Proposed Offsetting Lands** and the Ramsar Site, due to the large separation distance, assimilative capacity of the intervening waters and nature of the Proposed Offsetting Measures comprised primarily of conifer deforestation, there is no potential for likely significant effect on the	No

Designated Site	Distance from EIAR Site Boundary (km)	Assessment of designated sites in Zone of Influence	Yes/No
	Distance to the Proposed Offsetting Lands: › Approx. 32.7km straight line distance › Approx. 41.5km hydrological connectivity	Ramsar Site as a result of the Proposed Offsetting Measures. There is no potential for likely significant effects upon the coastal/marine **habitats/ species** of this Ramsar Site due to; the estuarine/ coastal nature of the habitats, and the significant intervening hydrological distance between the Proposed Offsetting Lands and the coastal/ estuarine habitats of the Ramsar Site. **This Ramsar site is not within the Likely Zone of Influence and no further assessment is required.**	

6.5.1.2 NPWS Article 17 Reporting

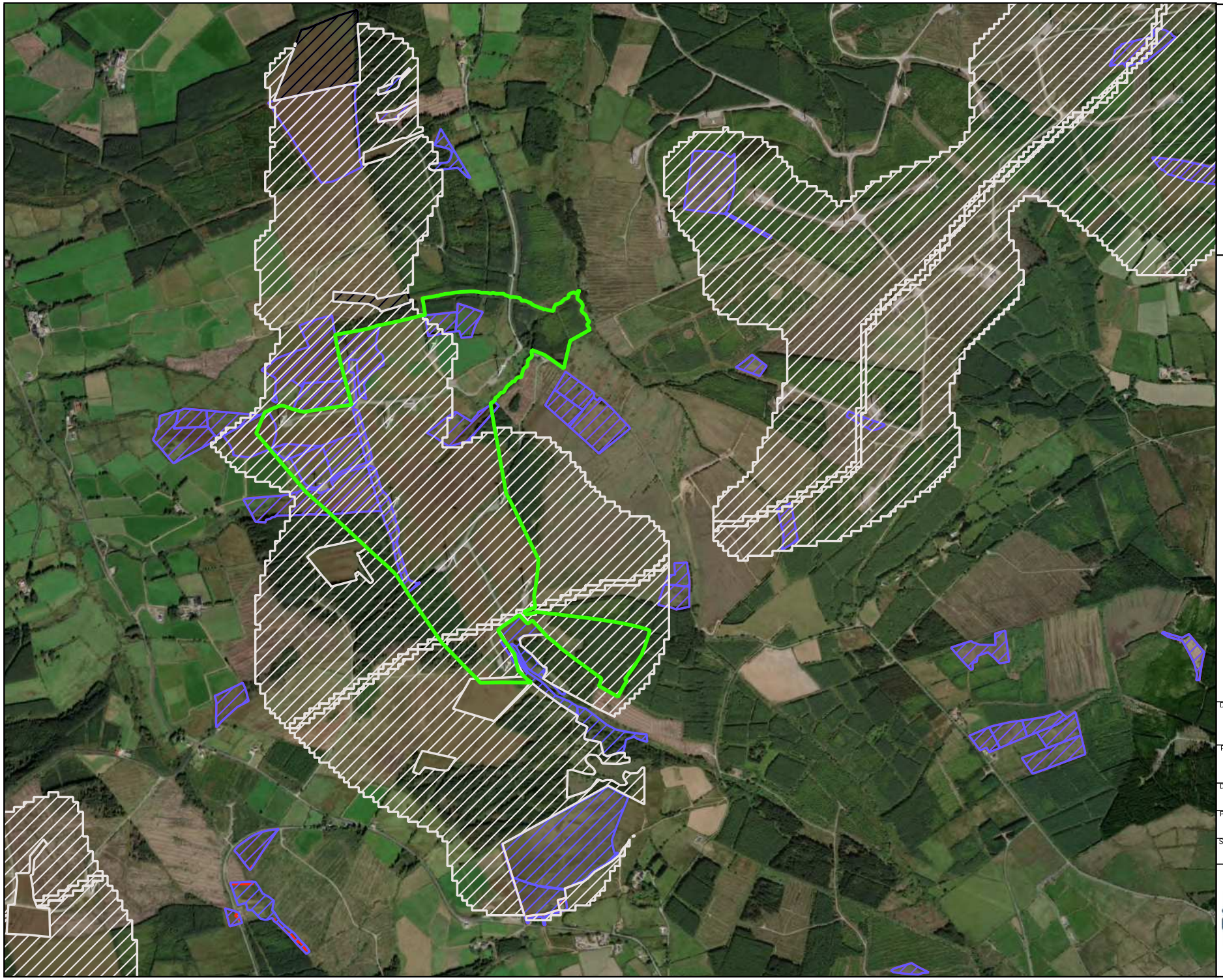
A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires datasets, the National Juniper Survey, Irish Semi-Natural Grassland Survey, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets were conducted prior to undertaking the multi-disciplinary walkover survey.

A search of the NPWS Article 17 datasets was undertaken as part of the desk study. The most recent National Parks and Wildlife Service (NPWS, 2019) data on the recorded distribution of EU Habitats Directive Annex I listed habitats was reviewed in relation to the Site and Proposed Offsetting Lands. This data is available in the form of the NPWS (2019) Article 17 reporting, and associated GIS data, on '*The Status of EU Protected Habitats and Species in Ireland*' (NPWS, 2019).

According to NPWS Article 17 datasets, the majority of the area within the Site is mapped as Annex 1 Alpine and Subalpine Heath, with areas of Annex 1 Dry Heath and Annex 1 Wet Heath also present throughout. The area surrounding the Site also features small areas classified as Annex 1 Dry Heath and Annex 1 Wet Heath, in addition to an area of Annex 1 Active Blanket Bog located approx. 50m north of the Site. According to NPWS Article 17 datasets, areas within the Proposed Offsetting Lands are mapped as Annex I Alpine and Subalpine Heath, with smaller sections of Annex I Dry Heath, Wet Heath and Active Blanket Bog also present.

The nearest Ancient Long-established Woodland to the Site, Lisdangan (2192), is located approx. 7.2km to the southeast of the Site, while Dooneen Wood (2261) is located approx. 6.7km northwest of the Proposed Offsetting Lands. The nearest Native Woodlands according to the 2003-2008 surveys are also located 7.2km from the Site and 6.7km from the Proposed Offsetting Lands respectively. The nearest semi natural grasslands are located approx. 3.8km from the Site, and 3.7km from the Proposed Offsetting Lands.

Figure 6-3 details the mapped Article 17 habitats in relation to the Site and Figure 6-4 details the mapped Article 17 habitats in relation to the Proposed Offsetting Lands.



Map Legend

- Taurbeg EIAR Site Boundary

Cork Article 17 Habitats

- Active Blanket Bog
- Alpine and Subalpine Heath
- Dry Heath
- Wet Heath

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Drawing Title
Article 17 Habitats within the Site

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NR	AvdGM
Project No.	Drawing No.
231030	Figure 6-3
Scale	Date
1:20,000	02.07.2025

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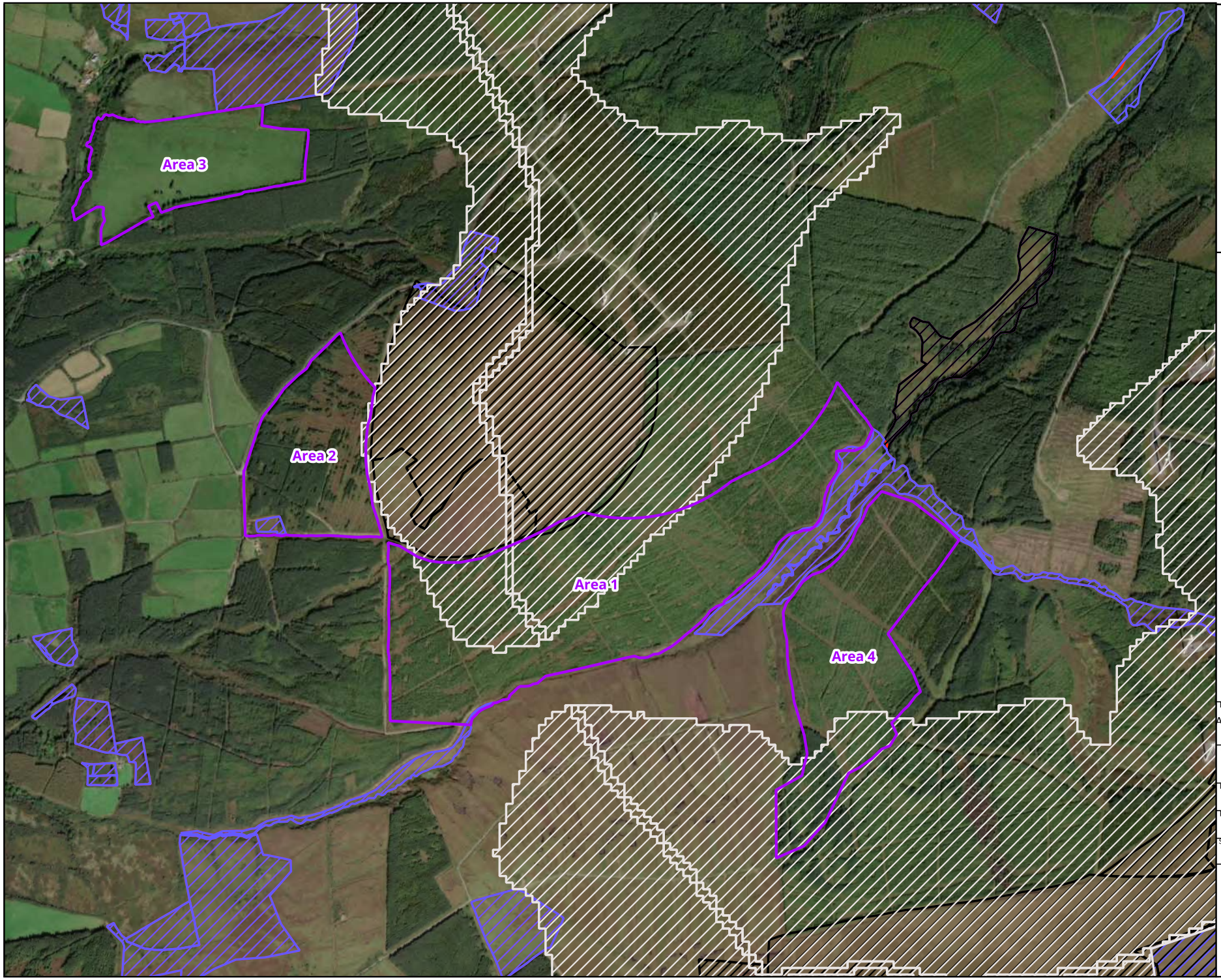

Map Legend

- Proposed Offsetting Lands

Kerry Article 17 Habitats

- Active Blanket Bog
- Alpine and Subalpine Heath
- Dry Heath
- Wet Heath

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Drawing Title
Article 17 Habitats within the Proposed Offsetting Lands

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NR	AvdGM
Project No.	Drawing No.
231030	Figure 6-4
Scale	Date
1:15,000	30.06.2025

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6.5.1.3 Vascular plants

A search was made in the New Atlas of the British and Irish Flora (Preston *et al*, 2002) to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (FPO) 2022 (SI 235 of 2022)) had been recorded in the relevant 10km squares in which the Site and the Proposed Offsetting Lands are situated (R00, R01, R10, R11 and R21). Each hectad contains 100 whole 1km squares containing terrestrial habitats. Species of conservation concern are given in Table 6-4.

Table 6-4 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad R00, R01, R10, R11 & R21

Common Name	Scientific Name	Status	Hectads
Small Cudweed	*Filago minima*	FPO, Near Threatened (NT)	R00
Bog Orchid	*Hammarbya paludosa*	FPO, Vulnerable (VU)	R10
Brown Beaksedge	*Rhynchospora fusca*	Near Threatened (NT)	R00

6.5.1.4 Bryophytes

A search of the NPWS online database for bryophytes (non-vascular land plants comprising of mosses, hornworts and liverworts) was also undertaken. No protected bryophytes were shown to occur within or directly adjacent to the Site or Proposed Offsetting Lands based on desk-based review.

6.5.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the NBDC records for the relevant hectads, R00, R01, R10, R11 and R21, provided records on a number of fauna species of conservation concern, excluding marine species and bird species. These are provided in the tables below. Records on bird species of conservational concern are described in Chapter 7: Ornithology.

Table 6-5 NBDC Records for Species of Conservation Interest in hectad R00, R01, R10, R11 & R21

Species	Scientific Name	Red List Status	Habitats Directive	Hectads
Badger	*Meles meles*	LC	WA	R00, R01, R10, R11, R21
Common Frog	*Rana temporaria*	LC	Annex V, WA	R00, R01, R10, R11, R21
Common Pipistrelle	*Pipistrellus pipistrellus sensu stricto*	LC	Annex IV, WA	R00, R01, R10, R11, R21
Daubenton's Bat	*Myotis daubentonii*	LC	Annex IV, WA	R00, R10, R11, R21
Fallow Deer	*Dama dama*	LC	WA	R00, R10
Hedgehog	*Erinaceus europaeus*	LC	WA	R00, R01, R10, R11, R21
Irish Hare	*Lepus timidus subsp. hibernicus*	LC	Annex V, WA	R00, R10, R11, R21

Species	Scientific Name	Red List Status	Habitats Directive	Hectads
Leisler's Bat	*Nyctalus leisleri*	LC	Annex IV, WA	R00, R01, R10, R11
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	LC	Annex II, IV, WA	R00, R01, R10
Marsh Fritillary	*Euphydryas aurinia*	VU	Annex II	R00, R01, R10, R11
Otter	*Lutra lutra*	LC	Annex II, IV, WA	R00, R01, R10, R11, R21
Red Squirrel	*Sciurus vulgaris*	LC	WA	R00, R10, R11, R21
Sika Deer	*Cervus nippon*	NA	WA	R00, R01, R10, R11
Soprano Pipistrelle	*Pipistrellus pygmaeus*	LC	Annex IV, WA	R00, R01, R10, R11, R21
Brown Long-eared Bat	*Plecotus auritus*	LC	Annex IV, WA	R01, R10
Common Lizard	*Zootoca vivipara*	LC	WA	R01, R11
Common Newt	*Lissotriton vulgaris*	LC	WA	R01, R10, R11, R21
Nathusius' Pipistrelle	*Pipistrellus nathusii*	LC	Annex IV, WA	R01, R10, R11
Pine Marten	*Martes martes*	LC	Annex V, WA	R01, R10, R11, R21
Stoat	*Mustela erminea subsp. hibernica*	LC	WA	R01, R10, R11, R21
Natterer's Bat	*Myotis nattereri*	LC	Annex IV, WA	R10
Pygmy Shrew	*Sorex minutus*	LC	-	R11, R21

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA - Wildlife Acts – Irish Wildlife Acts 1976 (as amended), LC – Least concern, NT – Near threatened, VU - Vulnerable.

Table 6-6 NBDC records for Invasive Species in hectads R00, R01, R10, R11, R21

Common Name	Scientific Name	Hectads
Indian Balsam	*Impatiens glandulifera*	R00, R10, R11, R21
Japanese Knotweed	*Fallopia japonica*	R00, R01, R10, R11, R21
Salmonberry	*Rubus spectabilis*	R10, R21
American Mink	*Mustela vison*	R00, R10, R11, R21
Sika Deer	*Cervus nippon*	R00, R01, R10, R11

Common Name	Scientific Name	Hectads
Giant-rhubarb	*Gunnera tinctoria*	R00, R10
Fallow Deer	*Dama dama*	R00, R10
Rhododendron	*Rhododendron ponticum*	R00, R01, R10
Brown Rat	*Rattus norvegicus*	R01
Bohemian Knotweed	*Fallopia japonica x sachalinensis = F. x bohemica*	R21

6.5.1.6 NPWS

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectads R00, R01, R10, R11 and R21. An information request was also sent to the NPWS requesting records from the Rare and Protected Species Database. Table 6-7 lists rare and protected species records obtained from NPWS, as well as those recorded available through the online NPWS map viewer.

Table 6-7 National Parks and Wildlife Service Records

Common name	Scientific name	Designation	Hectad
Reindeer Lichen (Cream Cup Lichen)	*Cladonia portentosa*	Annex V	R00, R01, R10, R21
Cladonia ciliata var. tenuis	*Cladonia ciliata var. tenuis*	Annex V	R00
Bog Orchid	*Hammarbya paludosa*	FPO Species, Vulnerable	R10
Small Cudweed	*Filago minima*	FPO Species, Near Threatened	R00
Common frog	*Rana temporaria*	HD Annex V, WA	R00, R01, R10, R21
Eurasian badger	*Meles meles*	WA	R01, R10, R11, R21
European Otter	*Lutra lutra*	Annex II, IV, WA	R00, R01, R10, R11, R21
Irish Hare	*Lepus timidus subsp. Hibernicus*	Annex V, WA	R00, R10, R21
Smooth newt	*Lissotriton vulgaris*	WA	R01, R11
Fallow Deer	*Dama dama*	WA	R21
Sika Deer	Cervus nippon	WA	R10, R11, R21
European hedgehog	*Erinaceus europaeus*	WA	R10, R21
Sea Lamprey	*Petromyzon marinus*	Annex II, V	R10

Common name	Scientific name	Designation	Hectad
Common lizard	*Zootoca vivipara*	WA	R01, R11
Irish Stoat	*Mustela erminea subsp. hibernica*	WA	R10, R11, R21
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	Annex II, Annex IV, WA	R00, R01
Barn Owl	*Tyto alba*	WA	R00, R01, R10, R11

FPO = Flora Protection Order; RL = Red List, VU = Vulnerable, WA = Protected Species: Wildlife Acts, Annex (No.) – Protected Species: EU Habitats Directive, BoCCI – RL = Red Listed, AL = Amber Listed, GL = Green Listed

6.5.1.7 Bats

A full description of the desk study information used to inform the bat aspect of this biodiversity chapter is provided in Section 4.2 of the Bat Report available in Appendix 6-1.

6.5.1.8 Aquatic Ecology

The Site:

A full description of the aquatic ecology desk study conducted for the Proposed Lifetime Extension Site, is provided in Section 3 of the Aquatic Baseline Report available in Appendix 6-2.

The majority of the Site is located within the Feale 'Catchment of other extant populations' for Freshwater Pearl Mussel. A portion of the southern area of the Site is located within the Munster Blackwater – Allow 'Catchment of SAC populations listed in S.I. 296 of 2009' for Freshwater Pearl Mussel. Freshwater Pearl mussel is not known from any of the survey watercourses as seen in Figure 2.1 of Appendix 6-2. Otter records were common downstream of the Site though most online records were historical. Fisheries data for the survey watercourses was largely deficient. The downstream-connecting River Feale is a designated salmonid watercourse under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293/1988). The Feale and wider catchment support fish species including brown trout (*Salmo trutta*), lamprey (*Lampetra sp.*), European eel (*Anguilla Anguilla*) and minnow. Tributaries of the downstream River Dalua is known to support salmonids as well as lamprey species (*Lampetra & Petromyzan*).

The Proposed Offsetting Lands:

The Proposed Offsetting Lands are not located within a *Margaritifera* SAC Catchment, however Area 4 and the majority of Area 1 of the Proposed Offsetting Lands are located within the Feale 'Catchment of other extant populations' for Freshwater Pearl Mussel.

There were no otter records within or adjacent to the Proposed Offsetting Lands. There are records of otter downstream of the Proposed Offsetting Lands within the River Maine and the River Feale.

Fisheries data downstream of the Proposed Offsetting Lands was also largely deficient. The downstream-connecting Shanowen River and its tributaries support fish species including salmon (*Salmo salar*), brown trout (*Salmo trutta*), lamprey (*Lampetra sp.*), European eel (*Anguilla Anguilla*), stone loach (*barbatula barbatula*) & three-spined stickleback (*Gasterostreus aculeatus*). Additionally, the unnamed water course which flows through Area 1 (refer to Figure 1-3, Chapter 1 of this EIAR) of the Proposed Offsetting Lands has downstream connectivity with the River Feale, which is a designated salmonid watercourse under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293/1988). The River Feale supports salmon (*Salmo salar*), brown trout (*Salmo trutta*), lamprey (*Lampetra sp.*), European eel (*Anguilla Anguilla*) and minnow.

6.5.1.9 Other Fauna

A search for Marsh Fritillary (*Euphydryas aurinia*) was carried out on the NBDC biodiversity map online viewer most recently on the 05.02.2025. No records of this species were recorded within or adjacent to the Site. Point data records for Marsh Fritillary are located approx. 175m southwest of the Proposed Offsetting Lands.

6.5.2 Conclusions of the Desk Study

The desktop study has provided information about the existing environment in the hectads, within which the Site and the Proposed Offsetting Lands are located. The mammal species recorded within the relevant hectads have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et al, 2009). Bat records within the 10km hectads that the Site and the Proposed Offsetting Lands are located in, revealed that the wider area has been studied for bats. This suggests that the area offers potential for foraging and commuting bat species.

As part of the desk study, NPWS Article 17 habitat records were consulted, and several Habitats Directive Annex I habitats have been recorded within, adjacent to or in the vicinity of the Site and the Proposed Offsetting Lands.

The majority of the Site along with Area 4 and the majority of Area 1 of the Proposed Offsetting Lands are located within a 'Catchment of other extant populations' for Freshwater Pearl Mussel (Feale catchment). A small portion of the Site is located within the Munster Blackwater – Allow 'Catchment of SAC populations listed in S.I. 296 of 2009' for Freshwater Pearl Mussel.

The River Feale, (a designated salmonid watercourse under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293/1988)), is located hydrologically downstream of the Site and the Proposed Offsetting Lands. Fish species records downstream of the Site and the Proposed Offsetting Lands typically consisted of salmonids (Salmon, brown trout), European eel, lamprey spp., and other common species of fish e.g. minnow.

The desk study identified that a variety of protected faunal species are known to occur within the vicinity of the Site and the Proposed Offsetting Lands, including bats, otter, common frog, marsh fritillary, Irish hare, badger and red squirrel. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The desk study provided information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impact on sensitive ecological receptors.

The Site and the Proposed Offsetting Lands are both hydrologically connected to the Lower River Shannon SAC. The Site is also hydrologically connected to the Blackwater River (Cork/Waterford) SAC. Both the Site and the Proposed Offsetting Lands are located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This is further described and assessed below in Section 6.7.5 of this Chapter. Pathways for effect were identified for the following sites which are further considered in the NIS and associated volumes prepared for the Proposed Project:

- Lower River Shannon SAC [002165]
- Blackwater River (Cork/Waterford) SAC [002170]
- Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161]

The Proposed Offsetting Lands are located adjacent to and minorly overlap with Mount Eagle Bogs NHA [002449]. Pathways for effect on the NHA were identified which are further considered in Section 6.7.5 of this Biodiversity Chapter.

6.6 Description of the Existing Environment

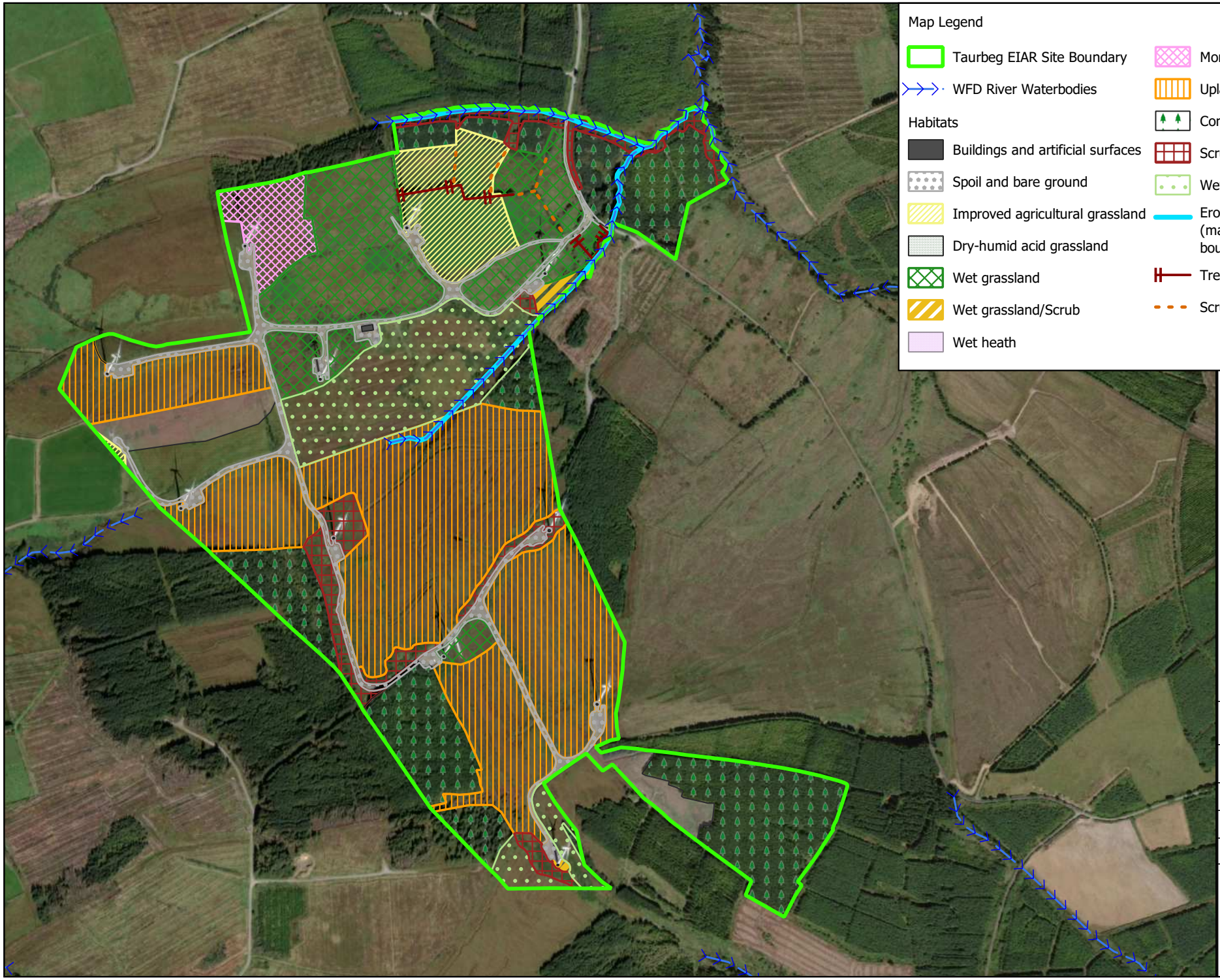
6.6.1 Description of Habitats within the Site

The habitat classifications and codes correspond to those described in '*A Guide to Habitats in Ireland*' (Fossitt 2000). A total of 15 habitats were recorded within the Site (Table 6-8). A habitat map of the Site is provided in Figure 6-5. The Site covers a total of approximately 112 hectares. Habitat mapping focused on areas in and around infrastructure within the Site.

Table 6-8 Habitats recorded within the Site

Habitat Name	Fossitt Code
Improved Agricultural Grassland	GA1
Wet grassland	GS4
Dry-humid Acid Grassland	GS3
Upland Blanket Bog	PB2
Wet Heath	HH3
Montane Heath	HH4
Conifer Plantation	WD4
Spoil and Bare Ground	ED2
Scrub*	WS1
Treeline	WL2
Wet Grassland/Scrub	GS4/WS1
Wet Heath/Scrub	HH3/WS1
Eroding/Upland rivers	FW1
Drainage Ditches*	FW4
Buildings and Artificial Surfaces	BL3
Improved Agricultural Grassland	GA1

** these habitats were not fully mapped as they are ubiquitous throughout the Site and frequently formed habitat mosaics.*



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Drawing Title
Habitats within the Site

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
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6.6.1.1 Improved Agricultural grassland (GA1)

Areas of **Improved Agricultural grassland (GA1)** were recorded predominantly in the northern section of the Site, with a small area also present within the northwestern area of the Site. These improved agricultural grasslands are generally species poor consisting predominantly of perennial rye grass (*Lolium perenne*) and other commonly occurring species such as broad-leaved dock (*Rumex obtusifolius*), dandelion (*Taraxacum officinale agg*), creeping buttercup (*Ranunculus repens*), yorkshire fog (*Holcus lanatus*), and white clover (*Trifolium repens*). Plate 6-1 shows a representative image of this habitat throughout the Site.

Plate 6-1 Representative image of Improved Agricultural Grassland (GA1) within the Site.

6.6.1.2 Wet Grassland (GS4)

Wet Grassland (GS4) habitats were commonly present throughout the northern section of the site, being recorded in the areas adjacent to Turbine 2, 5, 6 & 7. Additionally, a small area of Wet grassland was present in the southern section of site, adjacent to Turbine 10. These areas tended to be dominated by the following plant species; soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), broad-leaved dock (*Rumex obtusifolius*), yorkshire fog (*Holcus lanatus*), common sorrel (*Rumex acetosa*), creeping bent grass (*Agrostis stolonifera*), and perennial ryegrass (*Lolium perenne*). Other species also occurring within these grasslands include jointed rush (*Juncus articulatus*), white clover (*Trifolium repens),* marsh thistle (*Cirsium palustre*), tormentil (*Potentilla erecta*), sweet vernal grass (*Anthoxanthum odoratum*), common chickweed (*Stellaria media*), creeping thistle (*Cirsium arvense*), and spear thistle (*Cirsium vulgare*). The following sedges were also recorded within wet grassland habitats: star sedge (*Carex echinata*), oval sedge (*Carex leporina*), and carnation sedge (*Carex panicea*). Plate 6-2 shows a representative image of this habitat throughout the Site.

Plate 6-2 Representative image of Wet Grassland (GS4) within the Site.

6.6.1.3 Dry-humid acid grassland (GS3)

The habitat **Dry-humid acid grassland (GS3)** was recorded in the northwestern section of the site, on the northern side of T8. This area was composed of species including sweet vernal grass (*Anthoxanthum odoratum*), wavy hair grass (*Deschampsia flexuosa*), yorkshire fog (*Holcus lanatus*), jointed rush (*Juncus articulatus*), tormentil (*Potentilla erecta*), common cotton grass (*Eriiophorum angustifolium*), common haircap moss (*Polytrichum commune*), heath rush (*Juncus squarrosus*), heath bedstraw (*Galium saxatile*), heath woodrush (*Luzula multiflora agg.*), great wood rush (*Luzula sylvatica*), red bog-moss (*Sphagnum cappillifoillium)*, soft rush (*Juncus effusus*), common sedge (*Carex nigra*), cats ear (*Hypochaeria radicata*), devil's bit (*Succisa pratensis*), lousewort (*Pedicularis sylvatica), Pleurozium schreberi*, common sorrel (*Rumex acetosa*), springy turf-moss (*Rhytidiadelphus squarrosus*), pointed spear-moss (*Calliergonella cuspidata*), star sedge (*Carex echinata*), flat-topped bog moss (*Sphagnum fallax*), carnation sedge (*Carex panacea*), red fescue (*Fectuca rubra*). Plate 6-3 shows a representative image of this habitat throughout the Site.

Plate 6-3 Representative image of Dry-humid acid grassland (GS3) within the Site

6.6.1.4 Upland blanket bog (PB2)

Large sections of the central and southern areas of the Site have been classified as **Upland blanket bog (PB2)**. Site infrastructure adjacent to these habitats include T1, T8, T9, T10, T11, in addition to gravel roadways constructed within the site.

Common species recorded within the sites upland blanket bog habitats include tormentil (*Potentilla erecta*), ling heather (*Erica cinerea*), hares tail cottongrass (*Eriophorum vaginatum*), cross-leaved heath (*Erica tetralix*), bilberry (*Vaccinium myrtillus*), cladonia spp., wooly fringe-moss (*Racomitrium lanuginosum),* red bog-moss (*Sphagnum capillifolium*), heath rush (*Juncus squarrosus*), common cotton grass (*Eriophorum angustifolium*), wavy hair grass (*Deschampsia flexuosa*), springy turf-moss (*Rhytidiadelphus squarrosus*), red-stemmed feather-moss (*Pleurozium schreberi*), heath plait-moss (*Hypnum jutlandicum*), sweet vernal grass (*Anthoxanthum odoratum*), purple moor grass (*Molinia caerulea*), and western gorse (*Ulex galli*). Plate 6-4 shows a representative image of this habitat throughout the Site.

Additionally, in the bog habitat to the southeast of T8, sitka spruce (*Picea sitchensis*) had spread from the adjacent conifer plantation and saplings were abundant here.

Plate 6-4 Representative image of Upland blanket bog (PB2) within the Site

6.6.1.5 Wet Heath (HH3)

Wet Heath (HH3) habitat was recorded in two locations within the site boundary: between T3 and T8 in the northwestern section of the site, and south of T11 in the southeastern section of the site. Plate 6-5 shows a representative image of this habitat throughout the Site.

Plant species commonly recorded within these habitats included purple moor grass (*Molinia caerulea*), hares tail cotton grass (*Eriophorum vaginatum*), tormentil (*Potentilla erecta*), heath milkwort (*Polygala serpyllifolia*), bilberry (*Vaccinium myrtillus*), common cotton grass (*Eriophorum angustifolium*), ling heather (*Erica cinerea*), cross-leaved heath (*Erica tetralix*), sweet vernal grass (*Anthoxanthum odoratum*), soft rush (*Juncus effusus*), deergrass (*Trichophorum germanicum*), heath wood rush (*Luzula multiflora agg.*), heath rush (*Juncus squarrosus*). The following bryophytes were also abundant throughout the wet heath habitats on site; little shaggy-moss (*Rhytidiadelphus loreus*), bog groove-moss (*Aulacomnium palustre*), heath plait-moss (*Hypnum jutlandicum*), blunt-leaved bog-moss (*Sphagnum palustre*), red bog-moss (*Sphagnum capillifolium*), common haircap moss (*Polytrichum commune*).

Plate 6-5 Representative image of Wet Heath (HH3) within the Site

6.6.1.6 Montane Heath (HH4)

An area of **Montane Heath (HH4)** was recorded in the northern section of the site to the north of T5. Plate 6-6 shows a representative image of this habitat throughout the Site.

This area of Montane Heath featured the following species: purple moor grass (Molinia caerulea), wavy hair grass (*Deschampsia flexuosa*), ling heather (*Erica cinerea*), tormentil (*Potentilla erecta*), sweet vernal grass (*Anthoxanthum odoratum*), bilberry (*Vaccinium myrtillus*), hares tail cotton grass (*Eriophorum vaginatum*), viviparous fescue (*Festuca vivipara*), heath wood rush (*Luzula multiflora agg.*), star sedge (*Carex echinita*), heath rush (*Juncus squarrosus*), common sedge (*Carex nigra*), great woodrush (*Luzula sylvatica*). The following bryophytes were also abundant throughout the montane heath habitats on site; red-stemmed feather-moss (*Pleurozium schreberi*), little shaggy-moss (*Rhytidiadelphus loreus*), and common haircap moss (*Polytrichum commune*).

Plate 6-6 Representative image of Montane Heath (HH4) within the Site

6.6.1.7 Conifer Plantation (WD4)

Areas within the Site comprise different stages of **Coniferous Plantation (WD4)** forestry including recent clear-fell, second rotation, immature, semi-mature and mature forestry. These plantations are comprised of Sitka spruce (*Picea sitchensis).* Given the nature of such densely planted coniferous plantations, few other woody plant species occur. These plantations are found in the south, west and northeastern sections of the site. Plate 6-7 shows a representative image of this habitat throughout the Site.

Plate 6-7 Representative image of Conifer Plantation (WD4) within the Site.

6.6.1.8 Eroding/upland river (FW1)

Three watercourses which were classified as **Eroding/upland rivers (FW1)** flow through/along the site boundary the northeast of the site. Watercourses within and downstream of the Site are also described within Appendix 6-2.

The Knockahorrea_East stream (EPA Code: 23K33) flows through the northeastern section site, before it merges with the Taurbeg (EPA Code: 23T26) and Glennaknockane (EPA Code: 23G62) streams which together form a tributary of the River Feale (EPA Code: 23F01).

The Knockahorrea_East stream is boulder-cobble dominated with gravel also present. The watercourse is 1.5m wide, with a left-hand bank (LHB) height of 6 metres high and a right-hand bank (RHB) height of 12m. The LHB features wet grassland habitat (GS4) and a mosaic of wet grassland (GS4)/scrub (WS1), while the RHB is dominated by an immature plantation of sitka spruce (*Picea sitchensis*). At the time of the surveys the watercourse the flow was fast, with high water clarity, and had an approx. depth of 10-30cm. Plate 6-8 shows the Knockahorrea_East stream flowing in an easterly direction near the entrance to the existing Taurbeg Windfarm.

The Glennaknockane stream (EPA Code: 23G62) is a small stream that flows east along the northern boundary of the site. The stream flows through conifer plantations, before crossing beneath a local roadway which leads to the entrance of the existing Taurbeg Windfarm. It then continues flowing east for approx. 160m where it merges with the The Knockahorrea_East stream.

The Taurbeg stream (EPA Code: 23T26) flows north along a short section of the northeastern site boundary before it merges with the aforementioned Knockahorrea_East and Glennaknockane streams in the northeastern section of the Site.

Plate 6-8 Knockahorrea_East stream, an Eroding/ upland river (FW1), flowing through the Site in an easterly direction.

6.6.1.9 Drainage Ditches (FW4)

Historical drainage ditches were present along field boundaries and throughout areas of previously cut peatland within the site boundary. These were typically grown in with scrub, heath, and bogland vegetation. Additionally, drainage ditches were recorded along the edges of, and through forestry plantations located within the site boundary, as seen below in Plate 6-9.

Plate 6-9 Drainage Ditch (FW4) running through conifer forestry within the Site.

6.6.1.10 Treelines (WL2)

There are a small number of **Treelines (WL2)** present within the northeastern section of the site comprised of Horse chestnut (*Aesculus hippocastanum*), hawthorn (*Crataegus monogyna*), sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), grey willow (*Salix cinerea*), and cherry laurel (*Prunus laurocerasus*). A sitka spruce (*Picea sitchensis*) treeline is located to the north of T6, and forms part of a field boundary within the aforementioned **Improved agricultural grassland (GA1)** on the northern area of the site (Table 6-8).

Plate 6-10 Sitka spruce (Picea sitchensis) Treeline (WL2) located within the north of the Site.

6.6.1.11 Scrub (WS1)

Scrub (WS1) habitat was found throughout the site alongside the gravel roadways and adjacent to the T10 and T12. Additionally, scrub was recorded forming the boundaries between the fields in the northern section of the Site which were classified as **improved agricultural grassland (GA1)**. Common species within these areas of scrub included brambles (*Rubus fruticosus agg.*), gorse (*Ulex europaeus*), hawthorn (*Crataegus monogyna*), bracken (*Pteridium aquilinum*), and willow (*Salix spp.*). Scrub was also recorded as part of habitat mosaics which were present within the site boundary, and these are discussed below in Section 6.6.1.12 & Section 6.6.1.13. Plate 6-11 shows a representative image of this habitat throughout the Site.

Plate 6-11 Representative image of Scrub (WS1) within the Site.

6.6.1.12 Wet Grassland (GS4)/Scrub (WS1)

Wet grassland (GS4)/Scrub (WS1) was recorded in two locations within the site boundary during the surveys. Sections of the LHB of the Knockahorrea_East River in the northeast of the site, in addition to the area to the east, west and south of T10, located to the south of the Site, were both classified as **Wet grassland (GS4)/Scrub (WS1)** habitat mosaics. Plate 6-12 represents wet grassland/ scrub habitat mosaic located at T10.

Species recorded within these habitat mosaics included sweet vernal grass (*Anthoxanthum odoratum*), yorkshire fog (*Holcus lanatus*), hares tail cottongrass (*Eriophorum vaginatum*), soft rush (*Juncus effusus*), glaucous sedge (*Carex flacca*), butterbur (*Petasites hybridus*), marsh thistle (*Cirsium palustre*), common sorrel (*Rumex acetosa*), meadow buttercup (*Ranunculus acris*), willowherb (*Epilobium sp.*), rough meadow grass (*Poa trivialis*), carnation sedge (*Carex panicea*), cow parsley (*Anthriscus sylvestris*), oval sedge (*Carex leporina*), bedstraw sp. (*Galium sp.*), fireweed (*Chamaenerion angustifolium*), and dense areas of grey willow (*Salix cinerea*).

Plate 6-12 Representative image of Wet grassland (GS4)/ Scrub (WS1) mosaic within the Site

6.6.1.13 Wet Heath (HH3)/Scrub (WS1)

An area to the south/east of T2 has been classified as a mosaic of **Wet heath (HH3)/Scrub (WS1).** This habitat represents a degraded Annex I habitat with significant scrub encroachment. The common wet heath species recorded within this habitat mosaic included hares tail cotton grass (*Eriophorum vaginatum*), tormentil (*Potentilla erecta*), heath milkwort (*Polygala serpyllifolia*), bilberry (*Vaccinium myrtillus*), common cotton grass (*Eriophorum angustifolium*), ling heather (*Erica cinerea*), cross-leaved heath (*Erica tetralix*), sweet vernal grass (*Anthoxanthum odoratum*), soft rush (*Juncus effusus*), wavy hair grass (*Deschampsia flexuosa*). In addition to the above species, scrub species such as brambles (*Rubus fruticosus agg.*), grey willow (*Salix cinerea*), eared willow (*Salix aurita*), and gorse (*Ulex europaeus*) dominated areas creating a habitat mosaic.

6.6.1.14 Spoil and bare ground (ED2)

The roads running throughout the wind farm, in addition to the clearings adjacent to the wind turbines themselves are comprised of large gravels and are classified as **Spoil and bare ground (ED2)**. An example of this is seen in Plate 6-13 below.

Plate 6-13 Representative image of Spoil and bare ground (ED2) within the Site.

6.6.1.15 Buildings and Artificial Surfaces (BL3)

There is a pre-existing building located within the Site, which is part of the previously constructed wind farm. This building, and the surrounding hardstand, are classified as buildings and artificial surfaces (BL3) (**Error! Reference source not found.**). Additionally, the turbines themselves are also classified as buildings and artificial surfaces (BL3).

Plate 6-14 Representative image of Buildings and artificial surfaces (BL3) within the Site.

6.6.2 Description of Habitats within the Proposed Offsetting Lands.

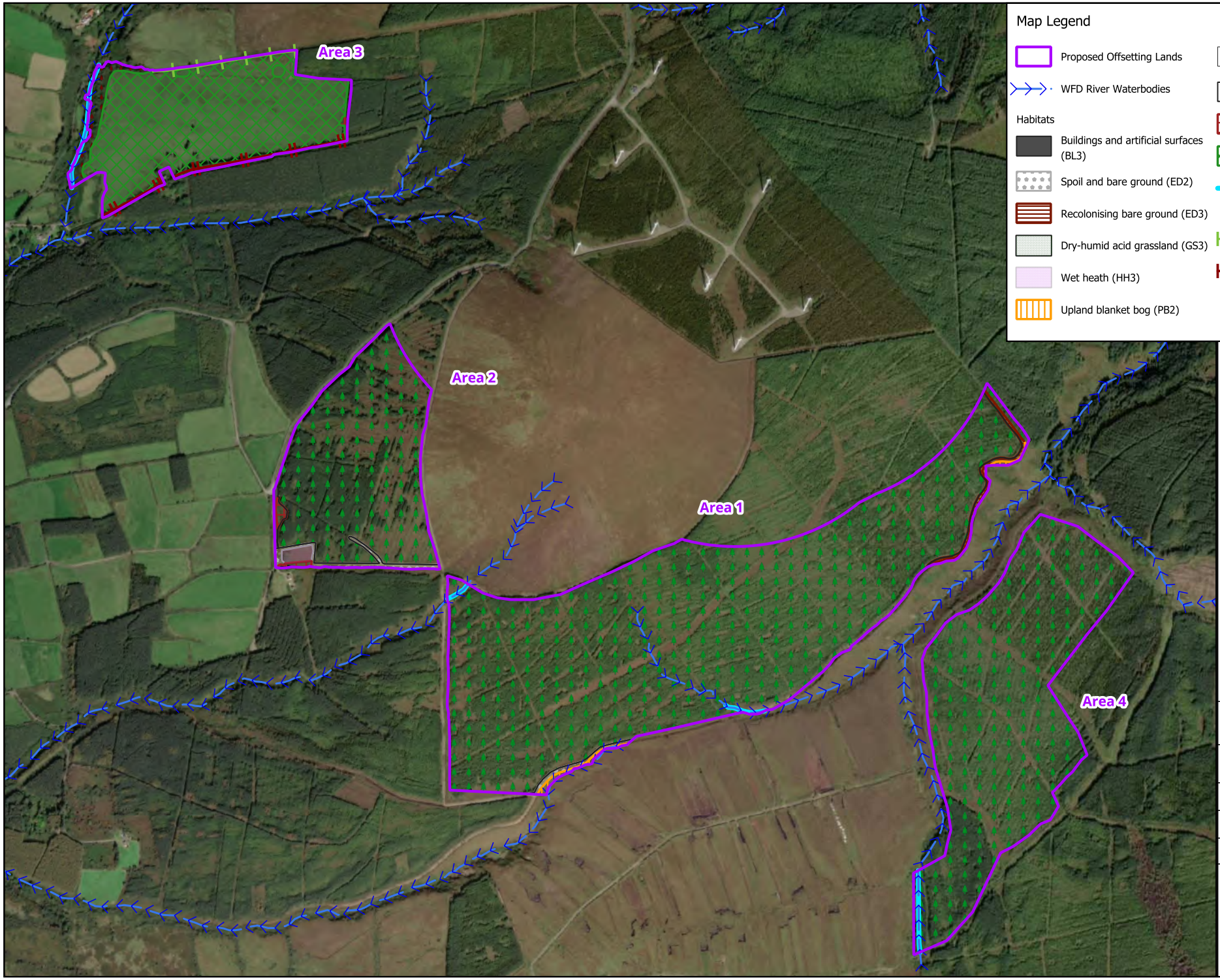
The habitat classifications and codes correspond to those described in '*A Guide to Habitats in Ireland*' (Fossitt, 2000). A total of 14 habitats were recorded within the Proposed Offsetting Lands (Table 6-9). A habitat map of the Proposed Offsetting Lands is provided in Figure 6-6. The Proposed Offsetting Lands cover a total of approximately 123.2 hectares.

As shown in Figure 6-6, the Proposed Offsetting Lands are divided into 4 areas, referred to as Area 1, Area 2, Area 3 and Area 4. Areas 1, 2 and 4 are dominated by Conifer Plantation (WD4) habitat. Other habitats such as Upland Blanket Bog and Wet Heath are located in small proportions and along the margins of Areas 1, 2 and 4. Area 3 is dominated by wet grassland (GS4) habitat with an area of (Mixed) broadleaved woodland (WD1) present within the western end. Other habitats such as hedgerows (WL1) and treelines (WL2) are present along the periphery of Area 3.

Table 6-9 Habitats recorded in the Proposed Offsetting Lands

Habitat Name	Fossitt Code
Conifer Plantation	WD4
Upland Blanket Bog	PB2
Wet Heath	HH3
Spoil and Bare Ground	ED2
Recolonising Bare Ground	ED3
Scrub*	WS1
Wet grassland	GS4
Dry-humid Acid Grassland	GS3
Buildings and Artificial Surfaces	BL3
Eroding/Upland rivers	FW1
Drainage Ditches*	FW4
(Mixed) Broadleaved Woodland	WD1
Hedgerow	WL1
Treeline	WL2

** these habitats were not fully mapped as they are ubiquitous throughout the Proposed Offsetting Lands and largely associated with forestry, forestry boundaries, farm tracks, field margins, road margins and field boundaries*



Map Legend

- Proposed Offsetting Lands
- WFD River Waterbodies

Habitats

- Buildings and artificial surfaces (BL3)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Dry-humid acid grassland (GS3)
- Wet heath (HH3)
- Upland blanket bog (PB2)
- (Mixed) broadleaved woodland (WD1)
- Conifer plantation (WD4)
- Scrub (WS1)
- Wet grassland
- Eroding/Upland Rivers (FW1) (mapped within site boundary)
- Hedgerows (WL1)
- Treelines (WL2)

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Drawing Title
Habitats within the Proposed Offsetting Lands

Project Title
Taurbeg Wind Farm Extension of Operational Life

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6.6.2.1 Conifer Plantation (WD4)

A proportion of the Proposed Offsetting Lands, primarily in Area 2 and the southern section of Area 4, are comprised of dense conifer plantations, with sitka spruce (*Pichea sitchensis*) dominating these areas. There is little understory growth within the densely planted blocks of forestry within the site, as fallen pine needles form a thick blanket over continuous areas. Tamarisk moss (*Thuidium tamariscinum*) is one of the only species found growing in these locations.

Gaps in these dense plantations come in the form of access paths and fire breaks allowing light and in turn more plant growth in some sections. Species commonly recorded included hard fern (*Blechnum spicant*), herb robert (*Geranium robertianum*), brambles (*Rubus fruticosus agg.*), common haircap moss (*Polytrichum commune*), holly (*Ilex aquifolium*), and willow (*Salix spp.*). Plate 6-15 shows a representative image of this habitat throughout the Proposed Offsetting Lands.

Plate 6-15 Representative of Conifer Plantation (WD4) within the Proposed Offsetting Lands.

Throughout the Proposed Offsetting Lands there were also areas of conifer plantations which did not take well to the wet, peaty soils resulting in patchy areas of established conifer plantations and areas of failed forestry. The areas of failed forestry and the fire breaks present within Areas 1, 2 and 4 of the Proposed Offsetting Lands were composed of remnant vegetation typical of upland blanket bog and wet heath habitats (Plate 6-16, Plate 6-17).

These areas of failed forestry and firebreaks within the conifer plantation (WD4) with vegetation that resembled upland blanket bog were dominated by species including purple moor grass (*Molinia caerulea*), ling heather (*Calluna vulgaris*), with abundant bilberry (*Vaccinium myrtillus*), common haircap moss (*Polytrichum commune*), red bogmoss (*Sphagnum capillifolium*), little shaggy moss (*Rhytidiadelphus loreus*), red peat moss (*Sphagnum rubellum*), cross leaved heath (*Erica tetralix*), and deer grass (*Trichophorum cespitosum*). The following species were frequently recorded: mountain fern moss (*Hylocomium spendens*), hare's tail cottongrass (*Eriophorum vaginatum*), little shaggy moss (*Rhytidiadelphus loreus*), springy turf moss (*Rhytidiadelphus squarossus*), broom forkmoss (*Dicranum scoparium*), devils' bit scabious (*Succisa pratensis*), common cotton grass (*Eriophorum angustifolium*),

bog groove-moss (*Aulocomnium palustre*), *Cladonia* sp., big red stem moss (*Pleurozium schreberi*), *Saccogyna* sp. and heath star moss (*Campylopus introflexus*). Species including tormentil (*Potentilla erecta*), heath plait-moss (*Hypnum jutlandicum*), glaucous sedge (*Carex flacca*), carnation sedge (*Carex panicea*), fringed bogmoss (*Sphagnum fibriatum*), *Mylia* sp., Soft bog-moss (*Sphagnum tenellum*), cow-horn bog moss (*Sphagnum denticulatum*), and greater wood rush (*Lyzula sylvatica*) were occasionally recorded.

Plate 6-16 Representative picture of conifer plantation firebreaks with remnant vegetation characteristic of Upland Blanket Bog.

These areas of failed forestry and firebreaks within the conifer plantation (WD4) with vegetation that best resembled wet heath were dominated by species including purple moor grass (*Molinia caerulea*), ling heather (*Calluna vulgaris*), with abundant bilberry (*Vaccinium myrtillus*), common haircap moss (*Polytrichum commune*), red bogmoss (*Sphagnum capillifolium*), red peat moss (*Sphagnum rubellum*) and papillose peatmoss (*Sphagnum papillosum*). The following species were frequently recorded: hare's tail cottongrass (*Eriophorum vaginatum*), common cotton grass (*Eriophorum angustifolium*), bilberry (*Vaccinium myrtillus*), cross leaved heath (*Erica tetralix*), deer grass (*Trichophorum cespitosum*) and heath star moss (*Campylopus introflexus*). Species including scaly male fern (*Dryopteris affinis*), tormentil (*Potentilla erecta*), heath rush (*Juncus squarrosus*), heath plait-moss (*Hypnum jutlandicum*), glaucous sedge (*Carex flacca*), carnation sedge (*Carex panicea*), little shaggy moss (*Rhytidiadelphus loreus*), fringed bogmoss (*Sphagnum fibriatum*), mountain fern moss (*Hylocomium spendens*), Soft bog-moss (*Sphagnum tenellum*), cow-horn bog moss (*Sphagnum denticulatum*), *Scapania gracilis* and *Diplophyllum albicans* were occasionally recorded.

Plate 6-17 Representative picture of conifer plantation area of failed forestry with remnant vegetation characteristic of Wet Heath.

6.6.2.2 Upland Blanket Bog (PB2)

A small section (approx. 0.345ha) of upland blanket bog (PB2) is located just within the southern boundary of Area 1 of the Proposed Offsetting Lands. This habitat consisted of species consistent to those mentioned in relation to remnant upland blanket bog vegetation in Section 6.6.2.1.1 above. No works are proposed within this habitat.

Plate 6-18 Representative picture of Upland Blanket Bog (PB2) habitat located within the southern most point of Area 1 of the Proposed Offsetting Lands and separated from the conifer plantation habitat by a heavily vegetated forestry track.

6.6.2.3 Wet Heath (HH3)

A small section (approx. 0.287ha) of isolated wet heath (HH3) is located within the southwest of Area 2 of the Proposed Offsetting Lands. This area was not planted and is isolated from the conifer plantation by a fence. Typical species include ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), purple moor grass (*Molinia caerulea*), hard fern (*Blechnum spicant*), bramble (*Rubus fruticosus agg.*), *Hypnum jutlandicum*, tormentil (*Potentilla erecta*), broad buckler-fern (*Dryopteris dilitata*), heath bedstraw (*Galium saxatile*), common feather-moss (*Kindbergia* praelonga) and bilberry (*Vaccinium myrtillus*). European gorse (*Ulex europaeus*) was abundant on the southern border of this habitat adjoining scrub habitat.

Plate 6-19 Representative picture of Wet Heath (HH3) located within the southwest corner of Area 2 of the Proposed Offsetting Lands.

6.6.2.4 Spoil and bare ground (ED2)

Gravel forestry roads ran through the Proposed Offsetting Lands, often at the boundaries of the individual areas. Spoil heaps resulting from extraction were located within Area 2 and featured varying levels of plant growth. Areas which lacked substantial plant growth were classified as spoil and bare ground (ED2). Plate 6-20 shows a representative image of this habitat within the Proposed Offsetting Lands.

Plate 6-20 Representative of Spoil and Bare Ground (ED2) within the Proposed Offsetting Lands.

6.6.2.5 Recolonising bare round (ED3)

Gravel forestry roads which ran along the perimeters of Areas 1, 2 and 4 of the Proposed Offsetting Lands featured varying levels of plant growth. Areas with substantial recolonisation were classified as recolonising bare ground (ED3) (Plate 6-21), with common species recorded including brambles (*Rubus fruticosus agg.*), ling heather (*Calluna vulgaris*), gorse (*Ulex europaeus*), lodgepole pine (*Pinus contorta*), common haircap moss (*Polytrichum commune*), foxgloves (*Digitalis purpurea*), common ragwort (*Jacobaea vulgaris*), bilberry (*Vaccinium myrtillus*), sitka spruce (*Picea sitchensis*), black bog rush (*Schoenus nigricans*), young willow saplings (*Salix sp.*), neat feather-moss (*Pseudoscleropodium purum*), springy turf-moss (*Rhytidiadelphus squarrosus*), and purple moor grass (*Moloinia caerulea*).

Plate 6-21 Representative of Recolonising Bare Ground (ED3) within the Proposed Offsetting Lands.

6.6.2.6 Scrub (WS1)

Areas of scrub (WS1) are located on the southwest boundary of Area 2 of the Proposed Offsetting Lands. These areas were comprised of species including brambles (*Rubus fruticosus agg.*), gorse (*Ulex europaeus*), grey willow, and bracken (*Pteridium aquilinum*). Occasional areas dominated by brambles (*Rubus fruticosus agg.*), gorse (*Ulex europaeus*), and bracken (*Pteridium aquilinum*) which had species composition characteristic of scrub habitat were located within the conifer plantation. Plate 6-22 shows a representative image of this habitat on the southwest boundary of Area 2 of the Proposed Offsetting Lands.

Plate 6-22 Representative of Scrub (WS1) on the southwest boundary of Area 2 of the Proposed Offsetting Lands.

6.6.2.7 Wet Grassland (GS4)

Area 3 of the Proposed Offsetting Lands is comprised primarily of an agricultural field classified as wet grassland (GS4), with common species including soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), clover (*Trifolium sp.*), greater plantain (*Plantago major*), marsh thistle (*Cirsium palustre*), *Poa* sp., perennial rye (*Lolium perenne*), daisy (*Bellis perennis*), creeping bent (*Agrostis stolonifera*), yorkshire fog (*Holcus lanatus*), ragwort (*Jacobaea vulgaris*), creeping thistle (*Cirsium arvense*), rough-stalked feather-moss (*Brachythecium rutabulum*), and pointed spear-moss (*Calliergonella cuspidata*). The wet grassland was relatively species poor and displayed evidence of past improvement. Plate 6-23 shows a representative image of this habitat within the Proposed Offsetting Lands.

Plate 6-23 Representative picture of Wet Grassland (GS4) within the Proposed Offsetting Lands.

6.6.2.8 Dry-humid Acid Grassland (GS3)

Small areas of Area 3 of the Proposed Offsetting Lands grade from wet grassland (described above) into dry-humid acid grassland (GS3). These areas are characterised by the presence of species including soft rush, common ragwort (*Jacobaea vulgaris*), common bent (*Agrostis capillaris*), sheep's fescue (*Festuca ovina*), green-ribbed sedge (*Carex binervis*), cat's-ear (*Hypochaeris radicata*), selfheal (*Prunella vulgaris*), glaucous sedge (*Carex flacca*), ribwort plantain (*Plantago lanceolata*), common smoothcap (*Atrichum undulatum*), common haircap moss (*Polytrichum commune*), common pocket moss (*Fisiden taxifolius*), springy turf moss (*Rhytidiadelphus squarossus*), common tamarisk-moss (*Thuidium tamariscinum*), and pointed spear-moss (*Calliergonella cuspidata*). Plate 6-24 shows a representative image of this habitat within the Proposed Offsetting Lands.

Plate 6-24 Representative picture of Dry-humid Acid Grassland (GS3) within the Proposed Offsetting Lands.

6.6.2.9 (Mixed) broadleaved woodland (WD1)

An area of (Mixed) broadleaved woodland (WD1) is located to the western end of Area 3 of the Proposed Offsetting Lands, with species recorded including sycamore (*Acer pseudoplatanus*), hazel (*Corylus avellana*), ivy (*Hedera sp.*), willow (*Salix* sp,), creeping buttercup (*Ranunculus repens*), brambles (*Rubus fruticosus agg.*), hawthorn (*Crataegus monogyna*), male fern (*Dryopteris filx más*), broad buckler-fern (*Dryopteris dilatata*), hard fern (*Blechnum spicant*), sedges (*Carex* sp.), common feather-moss (*Kindbergia* praelonga), herb robert (*Geranium robertum*), haircap mosses (*Polytrichum* sp.), Crisp pincushion moss (*Ulota crispa*), mountain fern moss (*Hylocomium spendens*), big shaggy-moss (*Rhytidiadelphus triquestrus*), *Pelia* sp., common pocket moss (*Fisiden taxifolius*), common tamarisk moss (*Thuiduim tamariscium*), flat-leaved scalewort (*Radula complanata*), common smoothcap (*Atrichum undulatum*), common striated feather-moss (*Eurhynchium striatum*), *Frulania* sp., and shining hookeria (*Hookeria lucens*). Sheep were able to gain access to this area of woodland from the adjacent field, and as a result the habitat was subject to grazing pressure.

Plate 6-25 Representative picture of (Mixed) broadleaved woodland (WD1) at the western boundary of Area 3 of the Proposed Offsetting Lands.

6.6.2.10 Hedgerows (WL1)

A hedgerow (WL1) comprised of bramble (*Rubus fruticosus agg.*), bracken (*Pteridium aquilinum*), gorse (*Ulex europaeus*) and willow (*Salix sp.*) was located along the northern boundary of Area 3 of the Proposed Offsetting Lands (Plate 6-26).

Plate 6-26 Representative picture of the Hedgerow (WL1) located along the northern boundary of the Area 3 of the Proposed Offsetting Lands.

6.6.2.11 Treelines (WL2)

A treeline made up of alder, hazel and willow, with brambles (*Rubus fruticosus agg.*),, bracken (*Pteridium aquilinum*), gorse (*Ulex europaeus*), ivy (*Hedera sp.*) and dog rose (*Rosa canina*) was located along the south-western boundary of Area 3 of the Proposed Offsetting Lands (Plate 6-27). Additionally, there was one immature Lawson's cypress (*Chamaecyparis lawsoniana*) also present within the treeline. Along the southeastern boundary of Area 3 of the Proposed Offsetting Lands there was treeline comprised exclusively of sitka spruce (*Picea sitchensis*) (Plate 6-28).

Plate 6-27 Treeline (WL2) located along the south-western boundary of Area 3 of the Proposed Offsetting Lands.

Plate 6-28 Sitka spruce treeline (WL2) located along the south-eastern boundary of Area 3 of the Proposed Offsetting Lands

6.6.2.12 Eroding/upland Rivers (FW1)

A number of watercourses passed through and adjacent to the boundaries of the Proposed Offsetting Lands, all of which were classified as eroding/upland rivers (FW1).

These watercourses include the Fulacht Fia Coom (EPA_Code: 22F41), two unnamed tributaries of the Tooreennascarty River (EPA_Code: 23T23), and the Knockatee_22 River (EPA_Code: 22K83).

The Fulacht Fia Coom is an eroding/upland (FW1) watercourse, the substrate of which is dominated by bedrock with areas of boulder-cobble substrate also common and gravels within pool sections. The watercourse is approx. 1m wide, with a left-hand bank (LHB) and right-hand bank (RHB) height of approx. 8 metres. Remnant wet heath vegetation dominates the riverbanks and surrounding area before grading into conifer plantation (WD4). Common species recorded growing on the banks of the Fulacht Fia Coom included ling heather (*Calluna vulgaris*), purple moor grass (*Molinia caerulea*), hard fern (*Blechnum spicant*), bracken (*Pteridium aquilinum*), common haircap moss, gorse (*Ulex europaeus*), and great woodrush (*Luzula sylvatica*). At the time of the surveys the watercourse the flow was slow, with high water clarity, and had an approx. depth of 5-8cm. Plate 6-29 shows the Fulacht Fia Coom stream flowing in a south-westerly direction.

The EPA mapped source of the northern of the two unnamed tributaries of the Tooreenascarty River was located within an area of conifer plantation (WD4) in Area 1 of the Proposed Offsetting Lands. However, this tributary rises further south than mapped on the EPA, likely due to it being altered historically. The ground truth extent of each watercourse's extent within the Proposed Offsetting Lands is presented within Figure 6-6. This the northern of the two unnamed tributaries of the Tooreenascarty River flowed in a south-easterly direction before leaving the boundary of the Proposed Offsetting Lands. Immediately downstream of the blocks of conifer plantation, the watercourse flowed across the surface of the peat in an area of upland blanket bog (PB2), with ling heather (*Calluna vulgaris*), purple moor grass (*Molinia caerulea*), grey willow (*Salix cinerea*), hard fern (*Blechnum spicant*), deer grass (*Trichophorum germanicum*), cross-leaved heath (*Erica tetralix*), red peat moss (*Sphagnum rubellum*),

and *Cladonia* sp. within and surrounding the streamflow. Further downstream, outside the boundary of the Proposed Offsetting Lands, the watercourse was classified as an eroding/upland river (FW1). The substrate of this section of the watercourse was dominated by cobbles, with bedrock and gravels also making up significant portions of the channel bed. Flow types within the channel at the survey location consisted of a riffle-glide sequence, with small chutes also present in a section where boulders were present. The watercourse is approx. 1.5m wide, with a left-hand bank (LHB) and right-hand bank (RHB) height both ranging from approx. 1-1.5 metres. Both banks of the river were dominated by upland blanket bog (PB2), with small areas of scrub (WS1) and wet heath (HH3) also present. At the time of the surveys the flow was moderate, with high water clarity, no siltation, and had an approx. depth of 15cm. The southern of the two unnamed tributaries of the Tooreenascarty River (Plate 6-31) flowed through the western boundary of Area 4, continuing to flow alongside Area 4 before converging with the northern of the two tributaries.

The Knockatee River is an eroding/upland river (FW1) which flows along the western boundary of Area 1 of the Proposed Offsetting Lands. The left-hand bank is dominated by an area of (Mixed) broadleaved woodland (WD1) as described above. The right-hand bank also featured (Mixed) broadleaved woodland (WD1), in addition to wet grassland (GS4).

In addition to the above watercourse, the Cloone (Shanowen), watercourse is mapped by the EPA as rising directly adjacent to the southern boundary of Area 1 of the Proposed Offsetting Lands. However, this watercourse was not present along this area of the Proposed Offsetting Lands and likely rises further west along it's EPA mapped route.

Plate 6-29 Representative picture of the Fulacht Fia Coom (Eroding/Upland Rivers (FW1)) within and looking downstream of the Proposed Offsetting Lands.

Plate 6-30 Representative picture of the unnamed tributary of the Tooreenascarty River (Eroding/Upland Rivers (FW1)) downstream of the Proposed Offsetting Lands.

Plate 6-31 Representative picture of the southern unnamed tributary of the Tooreenascarty River (Eroding/Upland Rivers (FW1)) flowing north along the boundary of Area 4 of the Proposed Offsetting Lands.

6.6.2.13 Drainage Ditches (FW4)

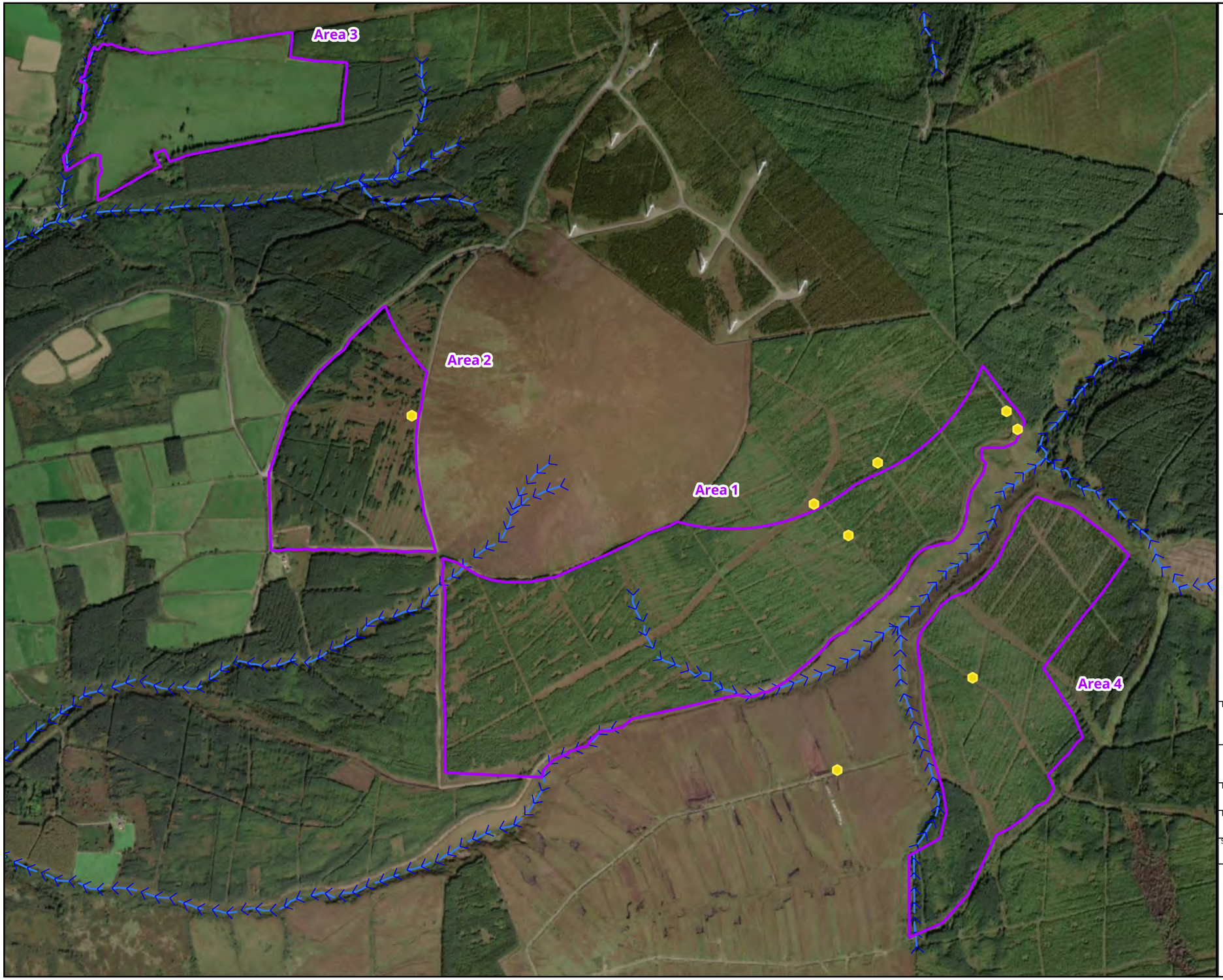
Drainage ditches (FW4) were ubiquitous throughout the site and were commonly associated with forestry plantations, field boundaries and roadways. Plate 6-32 shows a representative image of this habitat throughout the Proposed Offsetting Lands.

Plate 6-32 Representative picture of Drainage Ditches (FW4) within the Proposed Offsetting Lands

6.6.3 Invasive species

During field surveys, a search was conducted for Invasive Alien Species (IAS) listed on the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024) and Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). No First Schedule or Third Schedule Invasive Alien species were recorded within the Site during the survey conducted. The First Schedule and Third Schedule listed Invasive Alien plant species, *Rhododendron ponticum* was recorded within Areas 1, 2 and 4 of the Proposed Offsetting Lands (Plate 6-33). Recorded locations of *Rhododendron ponticum* within the Proposed Offsetting Lands are provided in Figure 6-7.

Plate 6-33 View of Rhododendron ponticum recorded within the Proposed Offsetting Lands.



Map Legend

- Proposed Offsetting Lands
- Rhododendron Records

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Drawing Title
Invasive species within the Proposed Offsetting Lands

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NR	AvdGM
Project No.	Drawing No.
231030	Figure 6-7
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6.6.4 Protected Flora

No botanical species listed under the Flora (Protection) Order 2022 (SI 235 of 2022), listed in the EU Habitats Directive (92/43/EEC) or listed in the Irish Red Data Books were recorded within the Site or the Proposed Offsetting Lands. All species recorded are common in the Irish landscape.

6.6.5 Fauna in the Existing Environment

The following subsections provide the results of the faunal surveys undertaken within the Site and the Proposed Offsetting Lands.

6.6.5.1 Bats

The results of the bat surveys are fully described in Section 4.3 of the Bat Survey Report included as Appendix 6-1 and are not repeated in full here. Surveys were carried out in 2024 in accordance with NatureScot, 2021. The bat survey results are summarized below.

6.6.5.1.1 *Bat Habitat Suitability Appraisal*

Existing Taurbeg Wind Farm (The Site)

Foraging and commuting habitat throughout the site ranged from Moderate Suitability (along mature treelines, mature forestry edges and scrub) to Low suitability (Areas of bogs, heaths, open habitats and isolated treeline may be used by a small number of bats and are not very well connected to the wider landscape).

A mature tree in close proximity to Turbine 7 presented a potential roost feature (PRF) suitable for a potential maternity roost (PRF-M). Aside from this roosting habitat ranged from Low roosting potential (i.e. the existing substation) to Negligible roosting potential (i.e. conifer plantation).

Proposed Offsetting Lands

Foraging and commuting habitat throughout the Proposed Offsetting Lands varied across the individual areas. Areas 1, 2 and 4 had moderate to high suitability commuting habitat and moderate foraging suitability due to the forestry boundary habitat and firebreaks throughout these areas. Foraging and commuting habitat within Area 3 of the Proposed Offsetting Lands ranged from low suitability (i.e. grassland habitats) to moderate-high suitability (i.e. broadleaved woodland and river on the western boundary).

Areas 1, 2 and 4 are assessed as proving negligible roosting suitability due to being comprised predominantly of conifer planation lacking appropriate roost features. No significant PRFs were identified within Area 3. A derelict building, outside the Proposed Offsetting Lands, located in close proximity to Area 3 was inspected during multidisciplinary walkover surveys of the Proposed Offsetting Lands, however, no signs of roosting bats were identified.

6.6.5.1.2 *Roost Surveys*

Existing Taurbeg Wind Farm (The Site)

Full details of Roost surveys undertaken in 2024 can be found in Section 4.3.2 of Appendix 6-1. A horse chestnut tree near Turbine 7 on the Site, the Substation of the Site and a derelict house within close proximity of Area 3 of the Proposed Offsetting Lands were inspected during roost surveys. The horse

chestnut tree while containing PRF-M features did not show any signs of roosting activity. The derelict house was assessed as having low roosting potential and had no visible signs of roosting. While bat droppings were identified within cobwebs in the attic of the substation, no activity was recorded during an emergence survey of the building.

Proposed Offsetting Lands

No Roost survey was conducted within the Proposed Offsetting Lands as no potential roost features were identified within the Proposed Offsetting Lands.

6.6.5.1.3 *Manual Activity Surveys*

Full details of Manual activity surveys undertaken in 2024 can be found in section 4.3.3 of Appendix 6.1. Bat activity was recorded on all surveys, which included a dusk roost emergence and walked transect surveys. In general, common pipistrelle (n=50) was recorded most frequently, followed by soprano pipistrelle (n=13) and Leisler's bat (n=11). Three instances of *Myotis spp.* and one of brown long-eared bat were recorded. Overall activity levels were low across the manual activity surveys.

6.6.5.1.4 *Static Detector Surveys*

Full details of Static Detector Surveys undertaken in 2024 can be found in section 4.3.4 of Appendix 6.1

In total, 16,921 bat passes were recorded in 2024. Common pipistrelle (n=9,126) were the dominant species, followed by Leisler's bat (n=4,198) and *Myotis* spp. (n=1,255). Nathusius' pipistrelle (n=932), soprano pipistrelle (n=881) and brown long-eared bat (n=529) were less recorded. These Nathusius' pipistrelle records are outside of the species current known range (Article 17).

Bat activity was calculated as total Bat Passes Per Hour (bpph) of total recordings per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Autumn presented the highest bat activity, followed by Spring and Summer. Species recorded at Site tended to differ in proportion and composition across the seasons. Nathusius' pipistrelles were recorded almost exclusively in Spring. The proportion of common pipistrelle and Leisler's bat activity tended to double in Autumn. *Myotis* spp. and soprano pipistrelles were recorded across all seasons in various proportions and brown long-eared bats passes were mostly observed in Autumn.

In 2024, survey at height took place on the met mast located west of the Site, in an open habitat approx. 250 away from the nearest forestry. In total, 149 nights of bat monitoring at ground level and 128 nights at height was achieved. A total of 349 bat passes were recorded by the SM3 and 2,553 by the SM4 bat detector. The bat activity was overall higher at ground level compared to activity at height. Species diversity was higher at ground level with 6 bats species (including *Myotis* spp.) recorded against 3 bat species at height. Leisler's bats passes (n=276) were predominantly recorded at height with small numbers of common pipistrelle (n=19) also present and rare soprano pipistrelle (n=3).

6.6.5.1.5 *Dog-led Collision Monitoring Surveys*

Monthly carcass searches for bats and birds were conducted within the Site between January 2024 and December 2024. No bat corpses were discovered over the survey period.

6.6.5.2 Badger

No signs of badger were recorded within the Site.

Signs of badger were recorded along the north-eastern boundary of Area 1 of the Proposed Offsetting Lands in the form of prints on a forestry track (Plate 6-34).

No other signs of badger were recorded within the Site or the Proposed Offsetting Lands.

Plate 6-34 Badger prints located along the northern boundary of Area 1 of the Proposed Offsetting Lands.

6.6.5.3 Otter

Otter surveys were conducted on watercourses within the Site by MKO and at locations in the vicinity and downstream of the Site by Triturus. No signs of Otter (e.g. couches, slides, spraint, holts etc.) were recorded within or in the vicinity of the Site. Spraints were recorded downstream of the Site at survey points A4, C2 and D4 (Appendix 6-2). No breeding or resting areas were identified in the vicinity of any survey site during the surveys. It is likely that watercourses within the Site provide limited suitability to Otter due to their gradient, high energy and elevations above sea level. Please see Section 4, Appendix 6-2 for full details on each survey site and section 5.2, Appendix 6-2 for a discussion on otter findings.

Otter surveys were undertaken on the watercourses within and in the vicinity of the Proposed Offsetting Lands. No otter signs were recorded during surveys within and in the vicinity of the Proposed Offsetting Lands. Watercourses in the vicinity of the Proposed Offsetting lands may provide commuting and foraging potential, but provide limited holting opportunity due to their gradient, high energy and elevations above sea level.

6.6.5.4 Amphibians & Reptiles

No amphibians or reptiles were identified during the surveys conducted. However, frog spawn was frequently recorded within the drainage ditches at the edges of conifer plantations, as well as depressions within areas of the upland blanket bog and wet heath located within the boundary of the Site. No other evidence of amphibians or reptiles were recorded within the Site or the Proposed

Offsetting Lands. Wet areas including drains provide good habitat for amphibians throughout the Site and Proposed Offsetting Lands.

6.6.5.5 Fisheries and Aquatic Fauna

The Site:

A detailed Aquatic Baseline Report has been prepared for the Site and detailed results of Fisheries and Aquatic Faunal surveys for the Site are provided in Section 4 of Appendix 6-2 of the EIAR.

A total of 4 fish species were recorded at the 14no. survey locations for electro-fishing, within and downstream of the Site. These species were Atlantic Salon, Brown Trout, Stone Loach and European Eel. Five of the 14no. survey locations did not support resident fish populations at the time of survey. These survey locations with no fish present at the time of survey were located in the upper reaches of the respective watercourses. Salmonids were recorded at 9 of the 14no. survey locations with Brown trout located at all 9 of these locations and Atlantic salmon located at 6 of these locations. European Eel was only recorded at survey location C2 (See Appendix 6-2 for survey locations) with the likely lack of European Eel records within and downstream of the Site being the spate/ high energy nature of the watercourses and distance to the sea.

All macroinvertebrates recorded during biological water quality monitoring surveys were of Least Concern, with no nationally red-listed species present at any survey location. Survey sites A2 (located on the northern boundary of the Site), and A3 (located downstream of the Site), both achieved a Q-value of Q4 (Good Status). All other survey locations (See Appendix 6-2 for survey locations) failed to achieve Q4 Good status.

eDNA surveys were undertaken at four locations downstream of the Site, with freshwater pearl mussel, white-clawed crayfish and crayfish plague all tested for. No eDNA for any of these three species was detected at any of the survey locations.

Proposed Offsetting Lands

Fisheries habitat assessment was carried out along watercourses within and adjacent to the Proposed Offsetting Lands. Overall low fisheries value was assigned to the Fulacht Fia Coom stream, due to it's highly steep nature, narrow channel and bedrock substrate.

The unnamed tributary of the Tooreennascarty River was surveyed downstream of the Proposed Offsetting Lands, north of Area 4 and South of Area 1. The tributary in this area had semi compacted cobble and gravels and bedrock substrate. Overall spawning habitat for salmonids was considered to be moderate-low due to the overall high proportions of bedrock and cobble but otherwise clean gravels. Nursery habitat for salmonids was considered to be moderate due to the abundant presence of riffle to glide habitat transition, deeper pool areas for refuge and some shaded sections. Holding habitat for salmonids was negligible-low due to the shallow and upland nature of the stream. Spawning habitat for lamprey was negligible due to the predominantly course and semi-compacted nature of the channel substrate, and high-altitude nature of the channel. Lamprey nursery habitat was considered negligible due to the very low percentage of finer sediments, high energy of the watercourse and lack of upstream lamprey spawning habitat. European eel habitat was negligible-low due to the lack of significant refugia and overall high flow velocity.

Kick sampling was carried out at each fisheries habitat assessment location. No macroinvertebrates were recorded during the kick sample of the Fulacht Fia Coom stream. This is likely due to the largely unsuitable channel conditions at this watercourse. Macroinvertebrate density and diversity was low at the unnamed tributary of the Tooreennascarty River with two very pollution sensitive species present (2no. Brachyptera sp., 2no. Perla sp.), and one pollution tolerant species present (1no. Chironomid). This survey location was assigned a Q-Value of Q4 (Good Status).

6.6.5.6 Other Fauna

Mammal scat likely to be fox (*Vulpes vulpes*) was recorded within the Site and Proposed Offsetting Lands (Plate 6-35). No signs of red squirrel were identified during the surveys conducted. No signs of pine marten were identified during the surveys conducted. Numerous mammal trails were recorded throughout the Site, as well as the surrounding habitats. An example of one of these mammal trails can be seen below in Plate 6-36. Additionally, a potential rabbit burrow was recorded to the east of a section of the Proposed Offsetting Lands, located approximately 10m from the boundary (Plate 6-37).

Devils bit scabious was recorded across the Site and within Areas 1 and 2 of the Proposed Offsetting Lands and could potentially support marsh fritillary.

No significant area of suitable habitat for other taxa, species listed in Annex II or IV of the EU Habitats Directive, or other species of conservation concern was identified within the Site or Proposed Offsetting Lands.

Plate 6-35 Fox scat recorded adjacent to the Proposed Offsetting Lands

Plate 6-36 Example of a mammal trail recorded within the Site.

Plate 6-37 Mammal burrow recorded outside of the boundary of the Proposed Offsetting Lands.

6.6.6 Importance of Ecological Receptors

Table 6-10 lists all identified receptors and assigns them an ecological importance in accordance with the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009a). This table also provides the rationale for this determination and identifies the habitats that are KERs. These ecological receptors are considered in Section 6.7 of this report and mitigation/measures will be incorporated into the Proposed Project where required, to avoid potential significant impacts on the features.

Table 6-10 Key Ecological Receptors identified during the assessment

Ecological feature or species	Rationale	KER
Designated Sites		
European Designated Sites	The Site is hydrologically linked to downstream European sites: › Lower River Shannon SAC [002165] (2.2km hydrological distance) › Blackwater River (Cork/Waterford) SAC [002170] (6.5km hydrological distance) The Proposed Offsetting Lands are hydrologically linked to the downstream European site: › Lower River Shannon SAC [002165] (1.9km hydrological distance) Potential for Likely Significant Effects on these European sites was identified within the AA screening for the Proposed Project. Potential impacts on these European sites are assessed fully in the NIS and associated volumes for the Proposed Project. In the context of this Biodiversity Chapter these sites have been assigned International Importance and included as a KER as there is potential for indirect effects on these European sites via water pollution. The Site and the Proposed Offsetting Lands are both located within the: › Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161]. Due to the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161] being of Ornithological interest, within this EIAR, further consideration of effects on this SPA are contained within Chapter 7 Ornithology and are not included further in Chapter 6 Biodiversity.	**Yes**
Nationally Designated Sites	The Proposed Offsetting Lands overlap slightly with and are located adjacent to a portion of Mount Eagle Bog NHA. Taking a precautionary approach, during and following the Proposed Offsetting Measures, there exists the potential for significant effect on the peatland habitats of this NHA via the spread of the third schedule invasive species *Rhododendron ponticum*.	**Yes**

	In the context of this Biodiversity Chapter this site has been assigned National Importance and included as a KER as there is potential for indirect effects on this nationally designated site via spread of invasive species.	
Terrestrial habitats		
Local Importance (lower value) › Improved agricultural grassland (GA1) › Dry-humid Acid Grassland (GS3) (*Within the Proposed Offsetting Lands*) › Wet Grassland (GS4) (*Within the Proposed Offsetting Lands*) › Conifer Plantation (WD4) › Spoil and Bare Ground (ED2) › Recolonising Bare Ground (ED3) › Buildings and artificial Surfaces (BL3)	With the exception of Conifer Plantation (WD4) habitat within the Proposed Offsetting Lands, there will be no loss of any of these habitats as a result of the Proposed Project. The proposed loss of 105.5ha of Conifer Plantation at the Proposed Offsetting Lands represents the loss of a highly managed and homogenous habitat, of local importance (lower value), which is common throughout the wider landscape. This loss is not considered significant at any geographical scale. For these reasons, these habitats have not been identified as a KERs.	No
Local Importance (higher value) › Dry-humid Acid Grassland (GS3) (*Within the Site*) › Wet Grassland (GS4) (*Within the Site*) › Wet Grassland/ Scrub (GS4/WS1) › Scrub (WS1) › Wet Heath/ Scrub (HH3/WS1) › Hedgerow (WL1) › Treeline (WL2) › Mixed Broadleaved woodland (WD1)	These habitats are classified as habitats of Local Importance (higher value) as they provide suitable supporting habitat for a variety of faunal species at a local level. Wet Heath/ Scrub (HH3/WS1) mosaic habitat has been assigned Local Importance (Higher Value) due to it representing a degraded Annex I habitat with significant scrub encroachment. Given that there will be no loss of these habitats as result of the Proposed Project, no impacts on these habitats are anticipated at any scale during any phase of the Proposed Project. Therefore, these habitats are not included as KERs.	No
County Importance (Proposed Offsetting Lands) › Upland Blanket Bog (PB2) (*Within the Proposed Offsetting Lands*) › Wet Heath (HH3) (*Within the Proposed Offsetting Lands*)	Areas of Upland Blanket Bog (PB2) found at the margins of the Proposed Offsetting Lands, while degraded, are considered to represent the associated Annex I habitat: 'blanket bogs (*if active bog) (7130)'. Therefore, this habitat is considered to be of County Importance where it occurs. Areas of Wet Heath (HH3) found within a small extent of remnant Wet Heath (HH3) within Area 2 of the Proposed Offsetting Lands, while degraded, are considered to represent the associated Annex I habitat: 'northern Atlantic wet heaths with	**Yes**

	Erica tetralix (4010)'. Therefore, this habitat is considered to be of County Importance where it occurs. There are no works proposed in any area of Upland Blanket Bog or Wet Heath habitat within the Proposed Offsetting Lands. However, taking a precautionary approach, during and following the Proposed Offsetting Measures, there exists the potential for significant effect on these habitats via the spread of the third schedule invasive species *Rhododendron ponticum*. Upland blanket bog and wet heath habitats within the Proposed Offsetting Lands have the potential to be affected by invasive species. Any potential effects on these habitats caused by invasive species are dealt with in section 6.7.6. 'Treatment of Invasive Species'.	
County Importance (Site) › Upland Blanket Bog (PB2) (*Within the Site*) › Wet Heath (HH3) (*Within the Site)* › Montane Heath (HH4)	Areas of these habitats found within the Site, while degraded, are considered to represent their associated Annex I habitats: › Upland Blanket Bog: 'blanket bogs (*if active bog) (7130)'. Therefore, this habitat is considered to be of County Importance where it occurs. › Wet Heath: 'northern Atlantic wet heaths with Erica tetralix (4010)' › Monatne Heath: 'Alpine and Boreal heaths (4060)' Therefore, these habitats are considered to be of County Importance where they occur. There are no works proposed in any area of Upland Blanket Bog, Wet Heath or Montane Heath habitat within the Site. Given that there will be no loss of this habitats as result of the Proposed Project, no impacts on these habitats are anticipated at any scale during any phase of the Proposed Project. Therefore, these habitats within the Site are not included as KERs.	No
Aquatic Habitats		
Local Importance (higher value) › Eroding/upland rivers (FW1)	3 no. EPA mapped watercourses occur within and on the boundary of the Site and 3 no. EPA mapped watercourses occur within and on the boundary of the Proposed Offsetting Lands (as in Figure 6-6). All of these streams are considered Eroding/ upland Rivers (FW1). These Streams have been assigned Local importance (Higher Value) as they connect to various downstream waterbodies, which provide supporting habitat for aquatic species of local importance and provide connectivity with European Designated Sites such as the Lower River Shannon SAC [002165] and the Blackwater River (Cork/Waterford) SAC [002170]. These European Sites are of international importance.	**Yes**
Local Importance (Lower Value) › Drainage ditches (FW4)	Within the Site, historical drainage ditches were present along field boundaries and throughout areas of previously cut peatland within the site boundary. These were typically grown in with scrub, heath, and bogland vegetation. Additionally, drainage ditches were recorded along the edges of, and through forestry plantations located within the site boundary.	**Yes**

	Within the Proposed Offsetting Lands, drainage ditches (FW4) were ubiquitous throughout the site and were commonly associated with forestry plantations, field boundaries and trackways. Drainage ditches are highly modified and generally species poor where they occur but provide some connectivity with watercourses within the Site and Proposed Offsetting Lands. As such they are assessed as being local importance (lower value) but are considered further as a KER due to potential for conductivity with higher value watercourses.	
Fauna		
Otter	No Otter signs, in the form of print, slides, spraint, or holts, were recorded within the Site or the Proposed Offsetting Lands. It is likely that watercourses within the Site and Proposed Offsetting Lands provide limited suitability to Otter due to their gradient, high energy and elevations above sea level. However, watercourses downstream of the Site and the Proposed Offsetting Lands have the potential to support populations of Otter. Otter are protected under the Wildlife Act 1976 (as amended). Taking a precautionary approach, the potential for effect on otter was identified in the form of downstream surface water deterioration. Therefore, the Proposed Project has the potential to result in indirect effects on the receptor (as a result of deterioration of water quality) and otter is therefore included as a KER and requires further assessment.	**Yes**
Bats	The habitats within and surrounding the Site and Proposed Offsetting Lands are likely to be utilised by a bat population of Local Importance (higher value). Bats are likely to forage and commute within the vicinity of the Site and Proposed Offsetting Lands. While dog lead carcass surveys of the operating turbines did not reveal any impact on bats (0 carcass records), taking a precautionary approach, based on collision risk data carried out for the Existing Taurbeg Wind Farm (Appendix 6-1), potential for collision was identified for high collision risk species. Taking a precautionary approach, during the deforestation period of the Proposed Offsetting Measures there will be temporary losses of linear features for bats to utilise for commuting and forging within Areas 1, 2 and 4. The potential effect on bats as a result of the Proposed Offsetting Measures is limited to the temporary works phase loss or damage to commuting and foraging habitat. All bat species in Ireland are protected under both national legislation – (Wildlife Act, 1976, as amended) and European legislation – (Habitats Directive (92/43/EEC). During the Proposed Offsetting Measures and the continued operation of the Existing Taurbeg Wind Farm, the Proposed Project has the potential to result in negative effects on bats (as outlined above). Therefore, bats are included as a KER for further assessment.	**Yes**
Reptiles and Amphibians	The Proposed Project will not result in loss of suitable habitat for reptiles and amphibians. No habitat loss is associated with the extension of life of the existing Taurbeg Wind Farm and the	No

	removal of conifer plantation forestry will not result in the loss of any habitat for amphibians or reptiles. In addition, suitable habitat exists for amphibians and reptiles within the wider area of both the existing Taurbeg Wind Farm and the Proposed Offsetting Lands. Frog spawn was recorded within the Site. No evidence of amphibians or reptiles were recorded within the Proposed Offsetting Lands. The recorded evidence suggests that the Site and the Proposed Offsetting Lands are not utilised by populations of higher than local significance and no potential for significant effects have been identified at the population level. No habitat loss in relation to amphibians or reptiles will occur a result of the Proposed Project. Due to the nature of the Proposed Project, amphibians and reptiles are unlikely to be significantly affected. For this reason, amphibians and reptiles are not considered further in this EIAR. Significant effects are not anticipated.	
Additional protected fauna (e.g. Pine Marten, Red Squirrel, Badger, Irish Hare, etc.).	The recorded evidence suggests that the Site and the Proposed Offsetting Lands are not utilised by populations of protected fauna of higher than local significance and no potential for significant effects have been identified at the population level. Due to the nature of the Proposed Project, additional protected fauna are unlikely to be significantly affected. For this reason, other faunal species are not considered further in this EIAR. Significant effects are not anticipated.	No
Aquatic and Fisheries Species		
Aquatic and Fisheries Species	Watercourses within the Site and Proposed Offsetting Lands are hydrologically linked to downstream watercourses (and aquatic fauna within them) which have been assigned International Importance due to their designation as an SAC or as QI's of the SAC (e.g. otter, white-clawed crayfish). Known populations of salmon, brown trout and eel downstream would also be considered of Local Importance (Higher Value). There is potential for indirect effect on these features as a result of impacts on water quality. Fish and other aquatic species are therefore included as a KER for further assessment.	**Yes**

6.7 Ecological Impact Assessment

6.7.1 Do-Nothing Effect

If the Proposed Project were not to proceed, the existing Taurbeg Wind Farm would be decommissioned (as described in Chapter 4 of this EIAR). All above ground infrastructure would be removed from the Site (excluding access tracks, the onsite substation and associated hardstands). Semi-natural habitats within the Site would remain under their current management regime subject to natural vegetation succession and variation. Commercial forestry would go through cycles of felling and replanting.

The Proposed Offsetting Lands would continue to be subject to commercial forestry practices and agricultural grazing. *Rhododendron ponticum* stands within the commercial forestry areas of the Proposed Offsetting Lands would likely continue to proliferate. Areas of semi-natural habitats within the Proposed Offsetting Lands would remain under their current management regime subject to natural vegetation succession and variation.

Faunal utilisation of the Site and the Proposed Offsetting Lands would remain consistent with current levels subject to natural variation. The Bat Survey Report (Appendix 6-1) has identified that while bat activity levels on the site are currently in line with the nature of the habitats on the site, and dog lead carcass surveys did not record any bat carcasses, taking a precautionary approach the existing Taurbeg Wind Farm has the potential to have a negative effect on bats in the form of collision with active turbine blades and associated mortality. This potential negative effect on bats would not be present if the existing Taurbeg Wind Farm were decommissioned.

The habitat utilisation of the site for avian fauna in a 'do-nothing' scenario is considered in Chapter 7 of the EIAR.

6.7.2 Likely Significant Effects During Proposed Offsetting Measures

There is no construction phase associated with the Proposed Project. The existing Taurbeg Wind Farm is fully constructed with no infrastructure alterations proposed as part of this project. The Proposed Offsetting Measures consist entirely of deforestation, vegetation planting, grassland management and monitoring.

6.7.2.1 Effects on Habitats During Proposed Offsetting Measures

The effects on habitats **that are identified as KERs** are described in the below tables. Any effects on habitats caused by spread of invasive species is dealt with in section 6.7.6 'Treatment of Invasive Species'.

6.7.2.1.1 Assessment of Potential Effects on Groundwater, Surface Watercourses and Sensitive Aquatic Faunal Species during the Proposed Offsetting Measures

Table 6-11 Proposed Offsetting Measures assessment for rivers, streams and sensitive aquatic species

Description of Effect	The effects on water quality are fully described in Chapter 9 'Hydrology and Hydrogeology' of this EIAR and are described here in relation to ecology. This section assesses the potential for likely significant effects on groundwater/surface watercourses and associated aquatic faunal species, including, European eel, lamprey species, salmonids, coarse fish, and other aquatic species identified during the desk study and dedicated aquatic surveys and likely to occur within or downstream of the Proposed Offsetting Lands. Deforestation of conifer plantation related to the Proposed Offsetting Measures has the potential to give rise to likely significant negative effects on surface watercourses, groundwater and aquatic species. Pathways for negative effect include: › Release of sediments to drainage and surface water discharge routes during deforestation operations, › Release of nutrients to drainage and surface water discharge routes during deforestation operations, › Release of hydrocarbons to drainage and surface water discharge routes during deforestation operations.
Assessment of Significance prior to mitigation	In the absence of mitigation and following the precautionary principle, there is potential for Proposed Offsetting Measures to result in a significant indirect effect on the identified aquatic habitats and species at a local geographic scale in the form of water pollution during the Proposed Offsetting Measures. This effect will be temporary in duration. This would also result in impacts on aquatic receptors ranging from Local Importance (Higher Value) to a receptor of International Importance (i.e. the Lower River Shannon SAC and associated QI species).
Mitigation	Detailed mitigation measures in relation to the protection of surface water during the Proposed Offsetting Measures are detailed in Section 9.5.2 of Chapter 9 (Hydrology and Hydrogeology) of this EIAR. Mitigation by avoidance, design and monitoring will be employed to prevent any likely significant effects to surface waters, associated aquatic species or groundwater. Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed in Section 9.5.2.1 of Chapter 9, to ensure that deforestation, planting and other forestry operations result in minimal potential negative effects to the receiving environment. These mitigation measures are tried and tested, best practice mitigation measures which are implemented at forestry sites across the country. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" will be implemented during the deforestation activities. This will include a buffer of no ground disturbance within 5m of any relevant watercourse (i.e. drainage ditches) and 10-20m of any aquatic zone (i.e. rivers and streams). Minimum buffers will also be the primary mitigation measure in relation to phosphorous release to receiving waterbodies. Drain inspection and maintenance as well as surface water quality monitoring mitigation measures are outlined within Section 9.5.2.1 of Chapter 9. Sections 9.5.2.2 and 9.5.2.3 of Chapter 9 outline further mitigations to address the potential release of phosphorous and hydrocarbons during deforestation operations.

	No new forestry roads or tracks are proposed, and no new aquatic zone crossings are proposed. This will help to minimise the impact of deforestation operations on the receiving environment.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual negative effect on aquatic habitats, groundwater or aquatic species during the Proposed Offsetting Measures.

6.7.2.2 Effects on Protected Fauna during the Proposed Offsetting Measures

The Proposed Offsetting Measures have the potential to result in habitat loss and disturbance impacts on faunal species included as KERs, see Table 6-11. The following species have been brought forward for further assessment:

- Otter
- Bats

The potential for significant effects on aquatic species during the Proposed Offsetting Measures is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.7.2.1.1 above and is not repeated below.

6.7.2.2.1 *Assessment of Potential Effects on Otter during the Proposed Offsetting Measures*

Table 6-12 Impact assessment for otter during the Proposed Offsetting Measures

Description of Effect	Taking a precautionary approach, there is potential for watercourses within the vicinity and within the Proposed Offsetting Lands to provide suitable habitat for otter, albeit limited in value due to the above outlined rationale and likely only to be sporadically utilised. Therefore, in the absence of mitigation and taking a precautionary approach, there is the potential for works associated with the Proposed Offsetting Lands to result in an indirect effect on otter in the form of habitat loss and disturbance during the Proposed Offsetting Measures. This effect will be temporary in duration. During deforestation operations, the main threats to otters are identified to be: › Destruction or degradation of riverbank habitat, › Disturbance/ displacement, › Water pollution which could impact on prey availability (addressed in section 6.7.2.1.1).
Assessment of Significance prior to mitigation	**Degradation of riverbank habitat, Disturbance** Given the limited suitability of the Proposed Offsetting Lands for otter and the lack of any recorded otter signs, the effect is considered to be a non-significant an effect on a receptor of local importance (higher value). **Habitat Degradation (impacts on water quality)** Habitat degradation effects on aquatic species (including otter) via surface water and groundwater deterioration have been assessed fully in Section 6.7.2.1.1. This assessment is not repeated in this section.

Mitigation	**Degradation of riverbank habitat, Disturbance** While no significant effect on otter is anticipated, on a precautionary basis, the below measures will be put in place to minimise the potential disturbance effects to otter: › During deforestation and extraction (in areas where this applies), a minimum 10 m exclusion zone will be applied along the edge of any 'aquatic zone' (rivers/ streams) on or adjoining the Proposed Offsetting Lands . Machine traffic and timber stacking will not be permitted within this zone. Trees within the reach of the harvester arm will be felled by harvester and stacked outside the exclusion zone. Trees outside machine reach will be felled manually. Felled trees will be winched out of the exclusion zone where appropriate and safe to do so, or removed by extended harvester arm, for subsequent processing outside the exclusion zone avoiding mobilisation of soils. All other requirements relating to water exclusion zones, as set out in Section 6.1 of the Standards for Felling & Reforestation (DAFM, 2019) and Section 9.5.2 of Chapter 9 of this report will be adhered to. › Regarding any existing 'relevant watercourses' (drainage ditches), there will be no cleaning of any section of such watercourses within 50 m of an aquatic zone. › There will be no woody scrub/ shrub removal as part of the Proposed Offsetting Measures. While no otter signs were identified within the Proposed Offsetting Lands, it is noted that otter is a mobile species and could potentially utilise the Proposed Offsetting Lands sporadically. As such, prior to the commencement of deforestation works associated with the Proposed Offsetting Measures, a pre-deforestation Otter survey will be carried out by a qualified Ecologist to determine the likely presence of Otters on site in line with TII, 2008b guidance. **Habitat Degradation (impacts on water quality)** Habitat degradation mitigations have been outlined fully in Chapter 9 of this EIAR and are discussed in Section 6.7.2.1.1.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on otter as a result of the Proposed Project.

6.7.2.2.2 *Assessment of Potential Effects on Bats during the Proposed Offsetting Measures*

Table 6-13 Impact assessment on bats during the Proposed Offsetting Measures

Description of Effect	The potential effect on bats during the Proposed Offsetting Measures is limited to the temporary works phase loss or damage to commuting and foraging habitat. Areas 1, 2 and 4 of the Proposed Offsetting Lands that will undergo deforestation will be placed into windrows, after which areas of scrub will be planted throughout the deforestation areas. There will be no significant loss of foraging or commuting habitat post completion of the deforestation operations within Areas 1, 2 and 4 of the Proposed Offsetting Lands. However, taking a precautionary approach, during the deforestation period there will be temporary losses of linear features to utilise for commuting and forging. Area 3 of the Proposed Offsetting Lands will not lose any commuting or foraging habitat over any time period. No significant loss of connectivity is anticipated as windrows will be established at the time of deforestation. There will be no significant effect on roosting habitat as a result of the Proposed Offsetting Measures as all habitat within Areas 1, 2 and 4 of the Proposed Offsetting Lands is considered to have negligible suitability of roosting bats.

Assessment of Significance prior to mitigation	The temporary losses in commuting and foraging features are not considered to be significant at any geographical scale and is instead considered to be a temporary non-significant effect on a receptor of local importance higher value.
Mitigation	No significant effects with regard to loss of commuting and foraging habitat are anticipated and as such no mitigation is required in this regard. There will be no significant loss of foraging or commuting habitat post deforestation activities. Commuting and foraging habitat will remain present within the deforested areas through windrows and scrub planting. A full description of Areas 1, 2 and 4 of the Proposed Offsetting Lands after the Offsetting Measures are implemented is within Appendix 7-7 of the EIAR. Linear features within Area 3 of the Proposed Offsetting Lands will be bolstered and grasslands will be managed for biodiversity. These measures will increase the value of Area 3 for foraging and commuting bats.
Residual Effect following Mitigation	There is no potential for the Proposed Offsetting Measures to result in significant effects on the local bat population at any geographic scale. There will be no significant effect on the conservation status of any bat species as defined in '*The Status of Protected Habitats and Species in Ireland*' (NPWS, 2019).

6.7.3 Likely Significant Effects During Extended Operational Phase

6.7.3.1 Effects on Habitats during Extended Operational Phase

The Proposed Lifetime Extension will not result in any additional land take or loss of habitats and as such there is no potential for any significant effects in this regard. The Proposed Offsetting Measures aspect of the Proposed Project has the potential to result in the creation of habitats within the Proposed Offsetting Lands through natural habitat maturation and development within Areas 1, 2 and 4 of the Proposed Offsetting Lands and active farming for biodiversity in Area 3 of the Proposed Offsetting Lands. Details of the management that will be undertaken are provided in Appendix 7-7 Hen Harrier Offsetting Plan.

Treatment of invasive species as part of Proposed Offsetting Measures has been provided in Section 6.7.6 below.

As described above, the Proposed Offsetting Measures will consist of natural habitat development and maturation in areas 1, 2 and 4 of the Proposed Offsetting Lands and active farming for biodiversity in area 3 of the Proposed Offsetting Lands. These activities/ land uses do not have the potential to give rise to significant effects on rivers, streams, and sensitive aquatic faunal species at any geographical scale.

Continued operation of the existing Taurbeg Wind Farm has the potential to give rise to likely negative effects on surface watercourses, groundwater and aquatic species. Therefore, rivers, streams and sensitive aquatic species remain as KERs during the operational phase and are assessed in detail in the following subsections.

6.7.3.1.1 *Effects on Rivers, Streams, and sensitive aquatic faunal species during the Extended Operational Phase*

Table 6-14 Extended operational phase impact assessment for rivers, streams, open waterbodies and sensitive aquatic faunal species

Description of Effect	The effects on water quality are fully described in Chapter 9 'Hydrology and Hydrogeology' of this EIAR and are described here in relation to ecology. This section assesses the potential for likely significant effects on groundwater/ surface watercourses and associated aquatic faunal species, including, otter, European eel, lamprey species, salmonids, coarse fish, and other aquatic species identified during the desk study and dedicated aquatic surveys and likely to occur within or downstream of the Proposed Project. Taking a precautionary approach, continued operation of the existing Taurbeg Wind Farm has the potential to give rise to likely negative effects on surface watercourses, groundwater and aquatic species. Pathways for negative effect include: › Potential Hydromorphological and flood risk effects due to increased site runoff potential; › Release of sediments and suspended solids to drainage and surface water discharge routes due to minor maintenance works e.g. maintenance of site entrance, internal roads and hardstand areas; › Release of hydrocarbons to drainage and surface water discharge routes due to small volumes of oils and fuels that will be present on-site during the proposed extended operational phase.
Assessment of Significance prior to mitigation	Taking a precautionary approach, impact on water quality during the extended operational phase of the existing Taurbeg Wind Farm has been assessed as a negative, indirect, non-significant effect in the absence of mitigation.
Mitigation	Detailed mitigation measures in relation to the protection of surface water during the extended operational phase of the existing Taurbeg Wind Farm are detailed in Section 9.5.3 and its sub-sections of Chapter 9 (Hydrology and Hydrogeology) of this EIAR. Mitigation measures will be employed to prevent any likely significant effects to surface waters, associated aquatic species or groundwater. The drainage mitigations in place for the existing Taurbeg Wind Farm will continue to be utilised to prevent significant hydromorphological or flood risk effects. No additional measures are proposed as the measures outlined in 9.5.3.1 of Chapter 9 of this EIAR are considered sufficient to prevent any significant effects in this regard. The existing Taurbeg Wind Farm drainage measures have been effective in removing any silt generated during routine maintenance works. This has been reflected in the surface water sampling conducted at the site. In addition to the currently effective drainage measures, temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock. In addition, temporary blocking of drains downstream of works area can also be undertaken if roadside swales are absent. These measures will prevent the potential for release of sediments and suspended solids to drainage and surface water discharge routes during the extended operation of the existing Taurbeg Wind Farm. Any plant and equipment used during the extended operational phase will require refuelling during works within the Site. Appropriate management of fuels will be required to ensure that incidents relating to refuelling are avoided. Mitigation measures to avoid release of hydrocarbons at the Site, during the extended operation phase, are outlined in section 9.5.3.3 of Chapter 9 of this EIAR.
Residual Effect following Mitigation	Following the implementation of the mitigation measures outlined above, and the continued use of existing onsite drainage measures, no potential for significant effect has been identified at any geographic scale as a result of the Proposed Lifetime Extension.

6.7.3.2 Effects on Fauna during Operation Phase

The operation of the Proposed Project will not result in any additional habitat loss or deterioration, nor will it result in a significant increase in anthropogenic activity. There is no potential for significant negative effects in terms of disturbance on otter (identified as a KER), during the operational phase of the Proposed Project. The potential for significant effects on otter during the operational phase is restricted to indirect effects on their habitat resulting from water pollution, which has been discussed above in Section 6.7.3.1.1 and is not repeated below.

The Proposed Offsetting Lands, while designed for Hen Harrier, will have positive effects on a wider scope of biodiversity. Within Areas 1, 2 and 4 of the Proposed Offsetting Lands there will be an increase in habitat diversity allowing a wider selection of birds, mammals, insects (including pollinators), and other faunal groups to inhabit and utilise the area. Within Area 3 of the Proposed Offsetting Lands, the proposed grazing regime will also create habitat for birds, mammals, insects (including pollinators), and other faunal groups. Areas of taller and mixed sward vegetation will increase prey availability for a range of predators other than Hen Harrier and will create more optimal foraging areas for prey species.

Potential for significant effects on bat species resulting from the operation of the Proposed Project were identified and therefore, these are identified as KERs during the operational phase.

6.7.3.2.1 *Assessment of Potential Effects on Bats during the Extended Operational Phase*

Table 6-15 Extended operational phase impact assessment on bats

Description of Effect	Taurbeg Wind Farm has been operational since March 2006 and the operational life would be extended to 2036 as part of the Proposed Lifetime Extension. No changes in the surrounding habitat will occur by extending the lifespan of the wind farm. Given the extensive area of habitat that will remain undisturbed throughout the site, no effects with regard to loss of commuting, foraging or roosting habitat for bats are anticipated. In addition, there will be no loss of connectivity within the wider area as a result of the Proposed Lifetime Extension. Taking a precautionary approach, based on the findings of the Bat Survey Report (Appendix 6-1), a potential effect on high collision risk bats was identified in the form of collision risk with turbines during the Proposed Lifetime Extension. No other effects on bats were identified as a result of the continued operation of the existing Taurbeg Wind Farm.
Assessment of Significance prior to mitigation	Based on the results of the bat surveys and dog lead carcass searches of the existing Taurbeg Wind Fram (Appendix 6-1), collision risk with high collision risk bat species during the Proposed Lifetime Extension is considered to be a non-significant effect. No significant effects have been recorded over the survey period for the existing Taurbeg Wind Farm (Appendix 6-1) or are anticipated at any geographic scale.
Mitigation	A full description of the mitigation measures proposed during the Proposed Lifetime Extension are described in Section 6 of the Bat Report. While no significant effect on bats was identified, standard best practice measures will be applied to the Proposed Lifetime Extension. These include blade feathering on a precautionary basis and include an adaptive mitigation plan as detailed in Section 6 of Appendix 6-1. Blade feathering will be implemented as a standard across all existing turbines when wind speeds are below the cut-in speed of the turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).

	Full details of the adaptive mitigation measures can be found in Section 6 of Appendix 6-1.
Residual Effect following Mitigation	Following the implementation of the monitoring and mitigation described above, there is no potential for significant residual effects on bat species.

6.7.4 Likely Significant Effects During Decommissioning Phase

6.7.4.1 Taurbeg Wind Farm

The decommissioning of the existing Taurbeg Wind Farm is described in Chapter 4, Section 4.7 and Appendix 4-3 of this EIAR.

In order to minimise the effects on the environment during the decommissioning phase, turbine hardstands will be backfilled with soil and allowed to revegetate instead of excavating the areas of reinforced concrete. Other than the revegetating of turbine hardstands, there will be no habitat loss associated with the decommissioning phase of the existing Taurbeg Wind Farm and therefore, there will be no significant effects in this regard. No large-scale excavations or earthworks will be required as the development footprint (roads, turbine hardstands and foundations etc.) will be left in situ. There would be no additional or ancillary impacts associated with the decommissioning phase. Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above-ground turbine components will be separated and removed off-site for reuse or recycling. The on-site substation will remain in place as it will become a permanent part of the national electricity network.

Any soil material that will be imported to site as part of the foundation backfilling will be free of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). The site manager will take steps to ensure this sourcing suitably clean material and verify the quality of the material by having it inspected prior to bringing it to site by a suitably qualified ecologist. Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey.

Regarding biodiversity at the site, the decommissioning phase will involve the following best practice mitigation measures:

- All measures to mitigate the risks of contamination of watercourses as highlighted within this chapter (Chapter 6) and as outlined in Chapter 9, will be fully implemented.
- The areas within 50m of the hard-stand and turbine foundations will be subject to a pre-works terrestrial ecology walkover to highlight any constraints that may be present (e.g. breeding or resting places of protected species, presence of Invasive Plant Species).
- If any significant constraints are identified appropriate controls will be developed and integrated into the live decommissioning plan ahead of the commencement of the work.
- If any Third Schedule Invasive species are present in or adjacent to the works footprint, an Invasive Species Management Plan (ISMP) will be developed, and all recommendations implemented in accordance with the contemporary best practice measures.
- Speed limits will be enforced on internal roads.
- All edible wastes will be stored in covered segregated containers and disposed of at licensed facilities.
- No refuelling or other hydrocarbon related usage will be undertaken within 50m of any watercourse in relation to maintenance vehicles, plant or machinery.
- Any import of soil or fill necessary in the decommissioning process shall be from approved sources and appropriately tested or inspected to minimise the risk of import of invasive

species. Only soil appropriate to the site (pH, soil type) will be used. The re-seeding or natural revegetation of reinstated areas will proceed on the advice of a suitably qualified ecologist. Any seed mix used will be on the approval of the ecologist.

Following the above and the detailed procedure outlined within Appendix 4-3 of the EIAR, there are no anticipated significant effects on biodiversity as a result of the decommissioning phase of the existing Taurbeg Wind Farm.

6.7.4.2 The Proposed Offsetting Lands

There is no decommissioning phase associated with the Proposed Offsetting Lands, as all Proposed Offsetting Measures will be permanent. A monitoring plan has been developed for the Proposed Offsetting Lands, the full detail of which can be seen in Appendix 7-7 and Appendix 7-8 of this EIAR.

No potential for significant effects on biodiversity have been identified. The Proposed Offsetting Lands will continue to be monitored, all Proposed Offsetting Measures will be permanent, and any uplift in biodiversity value as a result of the Proposed Offsetting Measures will be retained.

6.7.5 Effects on Designated Sites

6.7.5.1 European Designated Sites

As per the EPA Guidance (2022), *"A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive"*. This section provides a summary of the key assessment findings with regard to potential impacts on European sites.

The Stage 1 Screening Assessment concluded as follows:

'Following an examination, analysis and evaluation of the relevant data and information set out within this Appropriate Assessment Screening Report, it is concluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Lifetime Extension, individually or in combination with other plans and projects, is likely to have significant effects on the following sites::

- *Lower River Shannon SAC [002165]*
- *Blackwater River (Cork/Waterford) SAC [002170]*
- *Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161]*

As a result, an Appropriate Assessment is required, and a Natura Impact Statement has been prepared.'

The NIS concluded as follows:

'This NIS has provided an assessment of all potential adverse effects on European Sites. The potential for adverse effects was identified for the following European Sites: Lower River Shannon SAC, Blackwater River (Cork/Waterford) SAC, and Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. No potential for adverse effect was identified for any other European Site.

Where the potential for any adverse effect on the Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. Therefore, it can be objectively concluded that the Proposed Lifetime Extension, individually or in combination with other plans or projects, will not adversely affect the integrity of the Lower River Shannon SAC or Blackwater River (Cork/Waterford) SAC.

The potential for adverse effect on Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA cannot be robustly blocked by avoidance, appropriate design, or mitigation measures.

Therefore, it is concluded that the Proposed Lifetime Extension will adversely affect the integrity of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, in view of the site's conservation objectives.

It is recommended that the Article 6(4) (of Council Directive 92/43/EEC (The EU Habitats Directive)) process be engaged. Volume 2 includes the Assessment of Alternative Solutions and Imperative Reasons of Overriding Public Interest.'

Due to the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161] being of Ornithological interest, within this EIAR, further consideration of effects on this SPA are contained within Chapter 7 Ornithology and are not included in Chapter 6 Biodiversity.

Mitigation measures for the protection of aquatic habitats, aquatic species, surface water quality and groundwater quality have been outlined within the NIS and within Sections 6.7.2 and 6.7,3, and Section 9.5 of Chapter 9. These mitigation measures have robustly blocked the potential for effect on the below EU Designated sites:

- Lower River Shannon SAC [002165]
- Blackwater River (Cork/Waterford) SAC [002170]

6.7.5.2 Nationally designated Sites

The following NHA was identified to be within the Likely Zone of Influence of the Proposed Project:

- Mount Eagle Bogs NHA [002449]

As outlined in Table 6-4 of this chapter, the Site is located entirely outside the NHA boundary and there is no potential pathway for likely significant effect on the NHA as a result of the proposed continued operation of the existing Taurbeg Wind Farm.

The NHA boundary slightly overlaps with the Proposed Offsetting Lands and is located adjacent to it. As described in section 6.6.3 of this Biodiversity Chapter, the third schedule invasive alien plant species *Rhododendron ponticum* was identified growing within Areas 1, 2 and 4 of the Proposed Offsetting Lands. Deforestation activities without proper cognisance of the presence of rhododendron have the potential to create habitat suitable for the accelerated proliferation of the invasive species which could increase the potential for colonisation of the NHA habitats by rhododendron.

The Mount Eagle Bogs NHA, by its status as a Natural Heritage Area has been afforded National Importance.

Any potential for impacts on the above listed nationally designated site (as outlined above), has been robustly blocked through the implementation of the mitigation measures outlined in Section 6.7.6 (immediately below this section). Following the implementation of these outlined mitigation measures, there is no potential for significant effect on Nationally Designated Sites.

6.7.6 Treatment of Invasive Species

The third schedule invasive species *Rhododendron Ponticum* was recorded at a number of locations throughout the Proposed Offsetting Lands. The Proposed Offsetting Measures have the potential to increase the spread of the third schedule invasive species *Rhododendron ponticum*. The spread of Rhododendron throughout the Proposed Offsetting Lands would have a negative effect on local biodiversity and after deforestation works, the Proposed Offsetting Lands would be susceptible to the spread of Rhododendron. In the absence of mitigation and following the precautionary principle, there is potential for works associated with the Proposed Offsetting Lands to result in a significant effect to receptors of both local importance (habitats present within the Proposed Offsetting Lands), county importance (Upland Blanket Bog habitat and Wet Heath habitat) and receptors of national importance in the adjacent Mount Eagle Bogs NHA. This effect has the potential to be permanent in duration.

An invasive species management plan has been developed and is outlined below:

- A pre-commencement survey for Rhododendron will be carried out within Areas 1, 2 and 4 of the Proposed Offsetting Lands to determine the extent and locations of Rhododendron prior to the Proposed Offsetting Measures taking place.
- All Rhododendron plants will be geolocated.
- A cut will be made at the base of each stem of each Rhododendron plant, after which a herbicide (glyphosate) will be applied to cut.

- Plants will be left in place and revisited for repeat treatment after 6 months.
- Rhododendron plants will not be interfered with during the deforestation operations in Areas 1, 2 and 4.
- After 1 year all, Rhododendron plants will be revisited to assess the effectiveness of treatment.
- If Rhododendron plants are dead, they will be cut at the base and left on site to decompose.
- If Rhododendron plants are alive then another treatment cycle as outlined above will be undertaken.
- An invasive species survey of Areas 1, 2 and 4 of the Proposed Offsetting Lands will be carried out each year following the Proposed Offsetting Measures for 10 years (2026-2036). This survey will be carried out by a competent ecologist. Any new areas of Rhododendron will be geolocated and subject to treatment.
- If seedling Rhododendron are identified during the yearly invasive species surveys, hand removal of emerging seedlings can be conducted in order to deal with any residual rhododendron.
- After 2036, the Applicant will commission an ecologist with the relevant experience to undertake invasive species surveys at 5-year intervals with a key focus on identifying Rhododendron seedlings or plants for removal.

Treating any Rhododendron which may self-seed in the adjacent NHA or peatland habitats is outside the scope of this project. However, this situation will be monitored during the yearly invasive species surveys as outlined above. If Rhododendron seedlings or plants are noted within the adjacent NHA, local NPWS will be contacted, and co-operation will be offered to assist with Rhododendron removal on these lands. Consequently, within the Proposed Offsetting Lands, Rhododendron will need to be continuously managed.

Following the implementation of mitigation, there will be no significant residual negative effect related to the spread of Rhododendron during or following the Proposed Offsetting Measures.

6.8 Cumulative Impact on Biodiversity

The Proposed Project was considered in combination with other plans and projects in the area that could result in cumulative impacts on biodiversity, including European Sites and Nationally designated sites. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects considered are listed in Chapter 2: Background of the Proposed Project and provided in full in Appendix 2-3 of this EIAR.

In relation to terrestrial habitats and species, a cumulative study area of 1km within the vicinity of the Site and the Proposed Offsetting Lands was considered. All projects within this 1km buffer of the Site and Proposed Offsetting Lands were considered when completing the cumulative assessment for terrestrial biodiversity. The geographical boundaries were chosen because of the common nature of the habitats recorded within the Site, which mostly comprises upland blanket bog, wet grassland, conifer plantations and heath habitats, and the Proposed Offsetting Lands, which mostly comprises managed agricultural grassland and commercial forestry.

The cumulative study area considered in relation to aquatic habitats and species follows the rationale that is set out in Section 9.5.7 of Chapter 9: Hydrology and Hydrogeology and is summarized below:

Separate hydrological cumulative study areas have been delineated for the Site and for the Proposed Offsetting lands. These cumulative study areas are shown in Figure 9-10 of Chapter 9: Hydrology and Hydrogeology. There will be no potential for cumulative effects beyond these cumulative study areas due to increases in flow volumes (as the catchment area increases) and increasing distance from the Site and the Proposed Offsetting lands.

The cumulative hydrological study area for the Site has a total area of 234km^2 and has been delineated as follows:

- The north of the Site is located in the Tralee Bay Feale Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects on the Feale River downstream of EPA Hydrotool Node: 23_1771 (Total Upstream Catchment Area of ~95km2); and,
- The south of the Site is located in the Blackwater (Munster) Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects downstream of EPA Hydrotool Node: 18_2469 on the Glenlara River. This Node is located ~2km upstream of the confluence of the Glenlara and Allow Rivers. In order to be conservative and for completeness, the cumulative study area extends downstream as far as Node 18_1756 which includes the entire catchment of the Glenlara River (Total Upstream Catchment Area of ~139km2)

Given, the nature of the Proposed Lifetime Extension and the lack of any significant groundworks, the delineated cumulative hydrological study area associated with the Site is considered to be very conservative.

The cumulative hydrological study area for the Proposed Offsetting lands has a total area of 74km^2 and has been delineated as follows:

- The Shanowen (Maine)_010 and the Clydagh (Feale)_010 WFD river sub-basins are included in the cumulative study areas as these are the river sub-basins within which the Proposed Offsetting lands are located. For the purposes of a conservative assessment the Maine_010 and Clydagh (Feale)_020 WFD river sub-basins further downstream are also included in the cumulative study area.

The assessment focused on the potential for cumulative impacts on biodiversity, including the KERs identified in Section 6.6.6. The surrounding land use is dominated by commercial forestry, agricultural grassland and bog habitat. Pressures exerted by Commercial forestry and agricultural practises (if intensive) can include surface water deterioration and habitat deterioration. The Proposed Project will not cumulatively add to these potential pressures exerted by commercial forestry or agricultural practices.

Following the detailed surveys undertaken and impact assessment provided in Section 6.7, it is concluded that there will be no significant residual negative effects on non-avian biodiversity associated with the Proposed Project. In addition, following an assessment of the potential for significant effects when considered in combination with other plans and project, no potential for significant cumulative effects on non-avian biodiversity were identified.

6.9 Alignment with Plans and Policy

The following development plans have been reviewed and taken into consideration as part of this assessment. The plans were chosen due to the geographical location of the Proposed Project area and the policies and objectives related to biodiversity that are contained within them.

- Cork County Development Plan 2022–2028
- Cork County Biodiversity Action Plan 2009-2014
- Kerry County Development Plan 2022-2028
- Kerry County Councils Biodiversity Action Plan 2022 – 2028
- National Biodiversity Action Plan 2023-2030
- Southern Regional Assembly Regional Spatial and Economic 2020-2040 Strategy (RSES)

The review focused on policies and objectives within the plans listed above that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality.

Table 6-16 below provides an assessment of the alignment between the Proposed Project and the above listed Plans.

Table 6-16 Assessment of Alignment with Plans

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
Cork County Development Plan 2022 – 2028	**Wind Energy Strategy:** **ET 13-5: Wind Energy Projects** a) Support a plan led approach to wind energy development in County Cork through the identification of areas for wind energy development. The aim in identifying these areas is to ensure that there are minimal environmental constraints, which could be foreseen to arise in advance of the planning process. b) On-shore wind energy projects should focus on areas considered 'Acceptable in Principle' and 'Areas Open to Consideration' and generally avoid "Normally Discouraged" areas as well as sites and locations of ecological sensitivity. **ET 13-6: Acceptable in Principle** Commercial wind energy development is normally encouraged in these areas subject to protection of residential amenity particularly in respect of noise, shadow flicker, visual impact and the requirements of the Habitats, Birds, Water Framework, Floods and EIA Directives and taking account of protected species of conservation concern. **ET 13-7: Open to Consideration** Commercial wind energy development is open to consideration in these areas where proposals can avoid adverse impacts on: • Natura 2000 Sites (SPA's and SAC's), Natural Heritage Areas (NHA's), proposed Natural Heritage Areas and other sites and locations of significant ecological value. **ET 13-8: Normally Discouraged** Commercial wind energy developments will be discouraged in these areas which are considered to be sensitive to adverse impacts associated with this form of development (either individually or in combination with other	Cork County Development Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. The Proposed Project has been subject to a full environmental assessment i.e. EIAR and Appropriate Assessment (Stage 1, 2, 3 and 4). The Proposed Project is in line with the biodiversity objectives of Cork County Development Plan.

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	developments). Only in exceptional circumstances where it is clear that adverse impacts do not arise will proposals be considered. **<u>Biodiversity:</u>** **BE 15-1: Support and comply with national biodiversity protection policies** a) Support and comply with the objectives of the National Biodiversity Plan 2017-2021 (and any future National Biodiversity Plan which may be adopted during the period of this Plan) as appropriate, b) Implement the current County Biodiversity Action Plan and any future updated Plan; c) Support and comply with biodiversity policy set out in other national and regional policy documents as appropriate. **BE 15-2: Protect sites, habitats and species** a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan. b) Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan. c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan. d) Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development. e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species. **BE 15-3: Local Authority plan making**	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	a) Ensure that biodiversity issues are considered at the earliest possible stages of plan making; b) Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil Strategic Environmental Assessment and Appropriate Assessment requirements); and c) Carry out ecological impact assessment of plans and strategies as appropriate. **BE 15-4: Local Authority development and projects** a) Ensure that biodiversity protection is considered at design stage for works and development planned and progressed by Cork County Council and that all such projects comply with nature conservation legislation and policy as required; b) Fulfil Appropriate Assessment and Environmental Impact Assessment requirements and carry out Ecological Impact Assessment in relation to Local Authority plans and projects as appropriate. **BE 15-5: Biodiversity on Council owned and managed land and property** a) Protect biodiversity and support the principle of biodiversity net gain on land and property owned and managed by Cork County Council. b) Support the implementation of positive conservation management on lands and property which are owned or managed by Cork County Council; c) Support and implement best practice in the management of roadside boundaries including tree lines and hedgerows managed by Council; d) Support national policy to create new woodlands on public land and participate in the Creation of Woodlands on Public Lands Scheme and any successor schemes; e) Where possible, develop and implement Pollinator Plans and/or Biodiversity Action Plans for lands managed by Cork County Council in accordance with the National Biodiversity Action Plan (and any future National Biodiversity Plan which may be adopted during the lifetime of this Plan) and the All-Ireland Pollinator Plan; f) Support the use of natural approaches to flood management and control on lands owned or managed by or on behalf of Cork County Council. g) The Council will incorporate primarily native planting into new landscaping schemes within its own developments **BE 15-6: Biodiversity and New Development** Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by: a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	issues during the planning process' and any updated versions of this advice; b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments; c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments; d) Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate; e) Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats; f) Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain. **BE 15-7: Control of Invasive Alien Species** Implement best practice to minimise the risk of spread of invasive alien species, on Council owned or managed land, and require the development and implementation of Invasive Alien Species Management Plans for new developments where required **BE 15-8: Trees and Woodlands** a) Protect trees the subject of Tree Preservation Orders. b) Make use of Tree Preservation Orders to protect important trees or groups of trees which may be at risk or any tree(s) that warrants an order given its important amenity or historic value. c) Encourage the provision of trees for urban shading and cooling in developments in urban environments and as an integral part of the public realm. d) Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting. e) Where appropriate, to protect mature trees/groups of mature trees and mature hedgerows that are not formally protected under Tree Preservation Orders **BE 15-9: Support for Communities and Other Stakeholders** Support community organisations and other stakeholders as follows: a. Implement the County Biodiversity Action Plan and any future updated Plan;	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	b. Support the implementation of the All-Ireland Pollinator Plan. c. Where possible, support community led initiatives to protect biodiversity including the development of community led Biodiversity Action Plans and Pollinator Plans. d. Work with statutory agencies, educational institutes and other organisations to address the issues relating to the protection of biodiversity in the County where possible and as appropriate **BE 15-10: Soils** a) Ensure the protection and conservation of the soils in County Cork by encouraging sustainable management practices and the reuse of brownfield lands. b) Identify areas of poorer soil in the County acknowledge their potential value for wildlife, and respect their limitations, particularly in terms of their assimilative properties to prevent pollution. **BE 15-11: Contaminated Land** a) Require that prior to permitting development on contaminated sites, developers will carry out a full contaminated land risk assessment to demonstrate: - How the proposed land uses will be compatible with the protection of health and safety (including the durability of structures and services) during both construction and occupation; and - How any contaminated soil or water encountered will be appropriately dealt with. b) In the case of development which requires the removal of soil, stones and invasive species, any removal requires the appropriate permits and disposal to authorised sites. **BE 15-12: Air Quality** a) Monitor air quality and air quality trends in accordance with EU policy directives, preserve good air quality where it exists, and take appropriate action, where required, including the provision of additional air quality monitoring infrastructure in urban areas and along major roads. b) Radon barriers should be provided in all new developments in compliance with best practice and relevant Building Regulations. c) Air emissions associated with all new development are to be in line with Environmental Quality Standards as set out in the Air Quality Standards Regulations 2011, or any updated/superseding documents.	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	BE 15-13: Noise and Light Emissions a) Seek the minimisation and control of noise pollution associated with activities or development, having regard to relevant standards, published guidance and the receiving environment. b) Ensure noise-sensitive developments are adequately protected from potential sources of noise (e.g. national roads). New developments should take account of, and mitigate against, any existing noise sources. c) Support the implementation of Noise Action Plans prepared for the Cork County area. d) Seek the minimisation and control of light pollution associated with activities of development, having regard to relevant standards, published guidance and the receiving environment and Dark Sky principles. e) Review and update Cork County Council Policy Guidelines for Public Lighting to take account of impacts of public lighting on wildlife and night skies. **Objective BE 15-14: Waste Prevention and Management** a) Support the policy measures and actions outlined in - 'A Waste Action Plan for a Circular Economy Ireland's National Waste Policy 2020-2025', and - Southern Region Waste Management Plan 2015 – 2021, or any successor plans b) Support circular and climate resilient economy principles and associated strategic infrastructure, prioritising prevention, reuse, recycling and recovery, and to sustainably manage all types of waste by ensuring the provision of adequate waste recovery, recycling and disposal facilities for the county **BE 15-15: Waste Prevention and Management of Waste Facilities** a) The expansion of existing waste facilities and the creation of new waste facilities shall comply with the criteria of the Southern Region Waste Management Plan set out above and be assessed through the development management process. b) Support the sustainable development of the Bottlehill facility for specialised and appropriate uses primarily associated with achieving the aims of the circular waste economy **BE 15-16: Waste Prevention and Management: Drinking Water Treatment and/or Wastewater Treatment** Ensure that sludge from drinking water treatment and/or wastewater treatment is appropriately managed, optimising potential for circular economy gains. **BE 15-17: Waste Prevention and Management**	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	a) Planning applications for infilling of marginal land through soil importation will be supported where it can be demonstrated that the developments accord with proper planning and sustainable development, ensuring that they are compatible with the protection of environmental resources including water quality, Natura 2000 sites, biodiversity, archaeological and landscape resources. b) Support will be provided for locating suitable sites within the county for the safe disposal of construction and demolition waste in conjunction with the Southern Waste Region. c) Construction and Environmental Management Plans (CEMPs)/ Construction and Demolition Management Plans shall be prepared for larger scale projects as set out in paragraph 15.12.24 and this requirement shall be assessed on a case-by-case basis as part of the development management process. d) Support the implementation of the recommendations and policies of the National Hazardous Waste Management Plan 2014-2020 **Strategic Objective SO5 – Green and Blue Infrastructure, Open Space and Biodiversity** Manage and enhance green and blue infrastructure, to protect and promote biodiversity, ecology and habitat connectivity, protect natural areas, enhance landscape character and maritime heritage, and manage access to green and blue spaces that provide recreation, amenity and natural areas	
Cork County Biodiversity Action Plan 2009 - 2014	Key Objectives: **Objective 1:** To review biodiversity information for County Cork and to prioritise habitats and species for conservation action. **Objective 2:** To collect data and use it to inform conservation action and decision making **Objective 3:** To incorporate positive action for biodiversity into local authority actions and policy **Objective 4:** To promote best practice in biodiversity management and protection. **Objective 5**: To facilitate the dissemination of biodiversity information. **Objective 6:** To raise awareness of county cork's biodiversity and encourage people to become involved in its conservation.	Cork County Biodiversity Action Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project will not prevent Cork County Council from achieving the objectives of the Biodiversity Action Plan.

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
Kerry County Development Plan 2022 - 2028	The Objectives and Policies relating to Biodiversity are listed below: **KCDP 11-1** Ensure that the requirements of relevant EU and national legislation, are complied with by the Council in undertaking its functions, including the requirements of the EU Birds and Habitats Directives. **KCDP 11-2** Maintain the nature conservation value and integrity of Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). This shall include any other sites that may be designated at national level during the lifetime of the plan in co-operation with relevant state agencies. **KCDP 11-3** Work with all stakeholders in order to conserve, manage and where possible enhance the County's natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the County. **KCDP 11-4** Promote nature-based solutions to meet national objectives towards achieving a carbon neutral economy by 2050. **KCDP 11-5** Support and facilitate the actions in the National Biodiversity Action Plan and Kerry County Councils Biodiversity Action Plan 2022 – 2028. **KCDP 11-6** Support community groups undertaking biodiversity projects and any opportunities that may arise from biodiversity funding/grants. **KCDP 11-7** Support the sustainable provision of access and information at natural heritage sites around the county, at appropriate locations. **KCDP 11-8** Support the recording of biodiversity data in the county and its referral to National Biodiversity Data Centre.	Kerry County Development Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project has been subject to a full environmental assessment i.e. EIAR and Appropriate Assessment (Stage 1, 2, 3 and 4). The Proposed Project is in line with the biodiversity objectives of Kerry County Development Plan. Works within the Proposed Offsetting Lands are in line with and support the biodiversity objectives of Kerry County Development Plan e.g. Objectives 3, 5, 16, 19, 21, 22, 27 and 28.

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	KCDP 11-9 Support Agri-environment schemes; the MacGillycuddy Reeks Mountain Access Reeks Forum, the Magharees Conservation Association; EIPs; EU LIFE projects and other existing or proposed biodiversity programmes being undertaken in the county. **KCDP 11-10** Support the NPWS in the ongoing management of Killarney National Park. **KCDP 11-11** Work with NPWS and other partners to support the Kerry UNESCO Biosphere Reserve and the implementation of initiatives contained in the Periodic Review 2017. **KCDP 11-12** Support the protection of the biodiversity and tourism-value of Killarney National Park by proactively engaging with all stakeholders to tackle Rhododendron infestation and combating illegal fires. **KCDP 11-13** Support the sustainable use of wetlands, including our Ramsar sites, for educational, recreational and or tourism uses where appropriate and compatible with environmental protection designations. **KCDP 11-14** Support actions identified in Ag Climatise including on-farm measures to sequester carbon by the establishment of wetlands at appropriate locations. **KCDP 11-15** Facilitate and support the protection and enhancement of wetlands as nature-based solutions to flood management, climate change, and the biodiversity crisis. **KCDP 11-16** Ensure invasive species are managed in compliance with the provisions of the EC (Birds and Habitats) Regulations (SI 477 of 2011), as amended, particularly Sections 49, 50 and the Third Schedule. Best practices, as produced and updated by relevant authorities, are to be adhered to in the management of invasive species particularly on sites proposed for development. **KCDP 11-17** Facilitate, in collaboration with relevant stakeholders increased awareness and the implementation of biosecurity measures to prevent the spread of invasive species, particularly along watercourses. **KCDP 11-18** Facilitate the provision of an appropriate site in the County for the disposal and management of invasive species and contaminated soil, further to best practice guidelines and the provisions of the EC (Birds and Habitats) Regulations (SI 477 of 2011), as amended.	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	KCDP 11-19 Support actions from the All-Ireland Pollinator Plan including the plan's recommendations for grassland management and pollinator friendly species. **KCDP 11-20** Support the management of appropriate green areas to become natural biodiversity areas to encourage natural wildflowers to recolonise and support enhanced bee and insect populations. **KCDP 11-21** Require, where necessary, proposals to be accompanied by a habitat map prepared in accordance with the Heritage Councils Best Practice Guidance for Habitat Survey and Mapping, 2011. **KCDP 11-22** Encourage and facilitate the retention and creation of features of local biodiversity value, ecological corridors and networks that connect areas of high conservation value such as watercourses, woodlands, hedgerows, earth banks and wetlands. **KCDP 11-23** Identify key areas in the County, in collaboration with other relevant bodies, where habitat mapping would be of particular benefit to record existing features of local biodiversity and where applicable to integrate this information in the development management and plan preparation process. **KCDP 11-24** Promote the integration and improvement of natural watercourses in development proposals having regard to the IFI's guidance Planning for Watercourses in the Urban Environment. **KCDP 11-25** Support projects such as the swift nesting project (that are compatible with protection of our architectural heritage); pollinator friendly initiatives, tree planting, nature based sustainable urban drainage systems and other actions that seek to enhance urban wildlife. **KCDP 11-26** Facilitate and support the actions of the tree management strategy for the respective municipal districts. **KCDP 11-27** Support the preservation and enhancement of the general level of broadleaf tree cover throughout the County in both urban and rural areas and ensure that development proposals satisfactorily retain existing trees and/or provide additional native planting. A Tree Survey Report shall inform applications where appropriate. **KCDP 11-28** Encourage the provision of locally provenanced native tree species including those recommended by the All-Ireland Pollinator Plan as part of development landscaping schemes.	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	KCDP 11-29 Work with stakeholders to protect and sustainably enhance the biodiversity and where appropriate the landscape and recreational interests of woodlands in the County. **KCDP 11-30** Support the Department of Agriculture, Food and the Marine's Creation of Woodland on Public Lands Scheme, on public authority owned lands in the county at appropriate locations.	
Kerry County Councils Biodiversity Action Plan 2022 – 2028	Key Objectives: **Objective 1** Mainstreaming biodiversity into decision making within the Local Authority **Objective 2** To conserve, protect and enhance biodiversity and ecosystem services in the county **Objective 3** That biodiversity underpins KCC's responses to the challenges of climate change **Objective 4** Work with a range of stakeholders to ensure protection and enhancement of biodiversity in the county **Objective 5** Increase awareness and appreciation of biodiversity within KCC and the community **Objective 6** Support the strengthening of the knowledge base, information and data on biodiversity in the county	Kerry County Councils Biodiversity Action Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project is in line with the Kerry County Councils Biodiversity Action Plan. Works within the Proposed Offsetting Lands are in line with and support the Objectives of Kerry County Councils Biodiversity Action Plan e.g. Objectives 2 and 4.
National Biodiversity Action Plan 2023-2030	**Objective 1:** Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity. Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan. **Objective 2:** Meet Urgent Conservation and Restoration Needs. Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.	The National Biodiversity Action Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project is in line with the National Biodiversity Action Plan 2023-2030.

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	Objective 3: Secure Nature's Contribution to People. Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy. **Objective 4:** Enhance the Evidence Base for Action on Biodiversity. This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts. **Objective 5:** Strengthen Ireland's Contribution to International Biodiversity Initiatives. Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.	Works within the Proposed Offsetting Lands are in line with and support the Objectives of the National Biodiversity Action Plan e.g. Objectives 2 and 4.
Southern Regional Assembly Regional Spatial and Economic 2020-2040 Strategy (RSES)	**RPO 1 – Environmental Assessment** a. Any reference to support for all plans, projects, activities and development in the RSES should be considered to refer to 'environmentally sustainable development' that has no adverse effects on the integrity of European sites and no net loss of biodiversity, that shall be subject to appropriate feasibility studies, best practice site/route selection (to consider environmental constraints such as landscape, cultural heritage, the protection of water quality, flood risks and biodiversity as a minimum), environmental assessment including EcIA to support development management and where required, the completion of statutory SEA, EIA and AA processes as appropriate b. The RSES seeks to protect, manage and through enhanced ecological connectivity, to improve the coherence of the Natura 2000 Network in the Southern Region. c. RSES support for other plans/ programmes (and initiatives arising) is on the basis of appropriate SEA, SFRA, EIA and AA processes being undertaken in order to ensure the avoidance of adverse effects on European Sites and ensure implementation of mitigation measures where required. d. Development Plans shall include an objective for the protection of European sites and Natural Heritage Areas (designated and notified proposed NHAs). **RPO 117 - Flood Risk Management and Biodiversity**	The RSES was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project has been subject to a full environmental assessment i.e. EIAR and Appropriate Assessment (Stage 1, 2, 3 and 4). The Proposed Project is in line with the biodiversity objectives of the Southern Regional Assembly Regional Spatial and Economic 2020-2040 Strategy (RSES) e.g. RPO 126.

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	It is an objective to avail of opportunities to enhance biodiversity and amenity and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned. Plans and projects that have the potential to negatively impact on Natura 2000 sites are subject to the requirements of the Habitats Directive. **RPO 124 - Green Infrastructure** a. It is an objective to promote the concept of connecting corridors for the movement of wildlife and encourage the retention and creation of features of biodiversity value, ecological corridors and networks that connect areas of high conservation value such as woodlands, hedgerows, earth banks, watercourses and wetlands. The RSES recognises the necessity of protecting such corridors and the necessity to encourage the management of features of the landscape that support the Natura 2000 network; b. Green infrastructure will be integrated into the preparation of statutory land-use plans in the Region, which will include identifying Green infrastructure and strengthening this network; c. All Development Plans and Local Area Plans shall protect, enhance, provide and manage Green infrastructure in an integrated and coherent manner addressing the themes of biodiversity protection, water management and climate action; and should also have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks, and protected species; d. Any future development of greenways, blueways, peatways, cycleways or walkways will include an assessment by the relevant authorities of any impacts that may arise from increased visitor pressures, in particular, on sensitive European sites and the design of the network will consider the provision of protective measures on sites sensitive to disturbance/visitor pressure. **RPO 126 – Biodiversity** a. Promote biodiversity protection and habitat connectivity both within protected areas and in the landscape through promoting the integration of green infrastructure and ecosystem services, including landscape, heritage, biodiversity and management of invasive and alien species in the preparation of statutory and non-statutory land-use plans. The RSES recognises the role of the National Biodiversity Data Centre through its Citizen Science initiatives; b. Support local authorities acting together with relevant stakeholders in implementing measures designed to identify, conserve and enhance the biodiversity of the Region; seek and support the implementation of the	

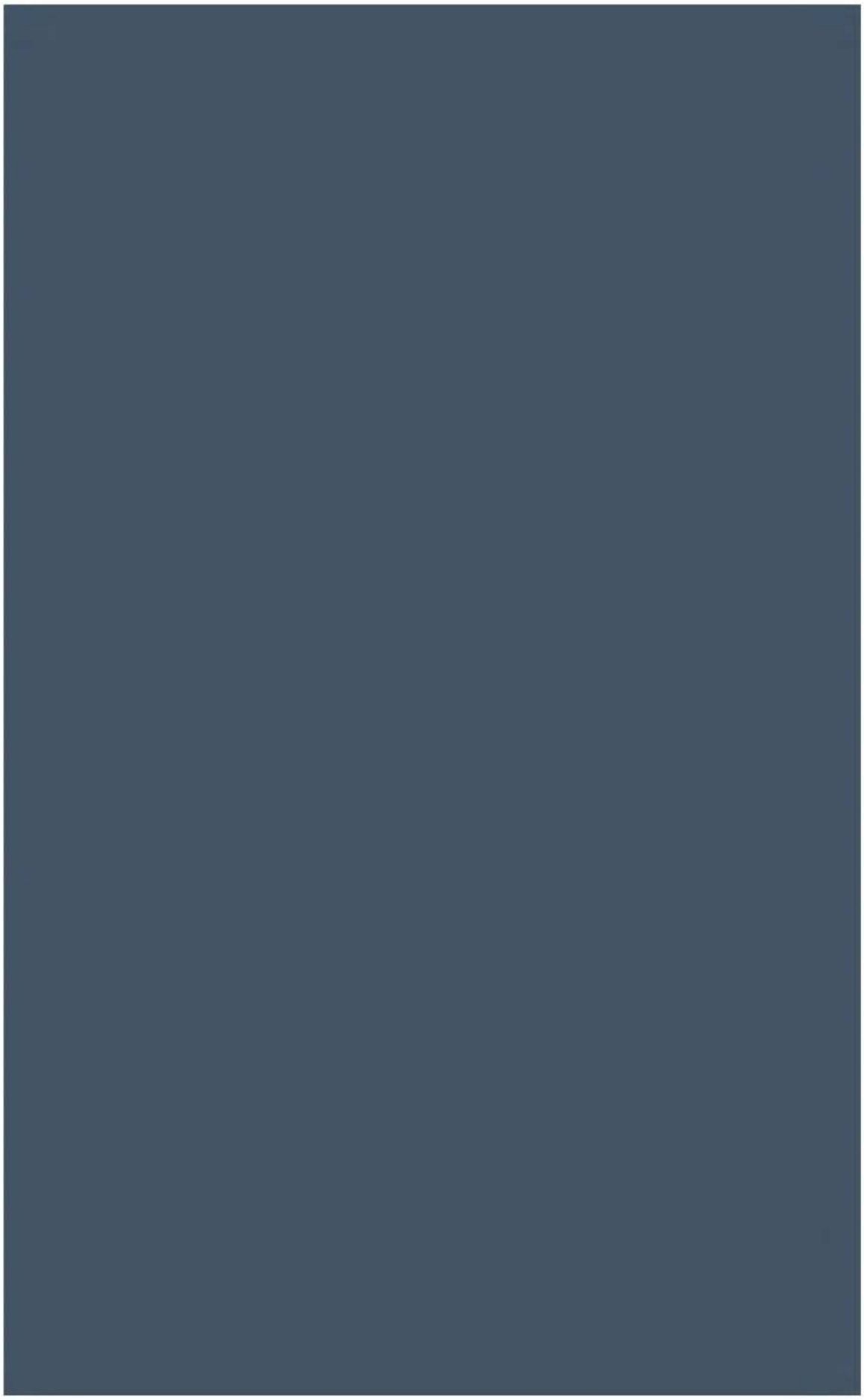
Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Alignment between the Proposed Project and Plans
	All-Ireland Pollinator Plan, National Biodiversity Action Plan and National Raised Bog SAC Management Plan; c. Local Authorities are required to carry out required screening of proposed projects and any draft land-use plan or amendment/ variation to any such plan for any potential ecological impact on areas designated or proposed for inclusion as Natura 2000/ European Sites and shall decide if an Appropriate Assessment is necessary, of the potential impacts of the project or plan on the conservation objectives of any Natura 2000/European Site; d. Support local authorities to carry out, monitor and review biodiversity plans throughout the Region. Planning authorities should set objectives in their land use plans to implement and monitor the actions as set out in the National and County Biodiversity Plans, as the conservation of biodiversity is an essential component of sustainable development. Local authorities should address the issue of fisheries protection and invasive introduced species and encourage the use of native species for landscape planting in rural areas, in the review of their biodiversity plans; e. Support local authorities to work with all stakeholders to conserve, manage and where possible enhance the Regions natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the Region. **RPO 151 – Integration of Land Use and Transport** j. The protection of the Natura 2000 networks and the ecological linkages connected to the Natura 2000 network. **RPO 202 - Natural Heritage, Biodiversity and Built Heritage assets** It is an objective to support initiatives that enhance and protect our Region's unique natural heritage, biodiversity and built heritage assets, recognising the contribution which education and outreach can play in developing understanding of biodiversity and heritage in our communities. Such initiatives should secure funding to support projects in the Region in line with the National Biodiversity Action Plan.	

6.10 Conclusion

Following consideration of the residual effects (post mitigation) it is concluded that the Proposed Project will not result in any significant effects on any of the identified KERs. No significant effects on receptors of International, National, County or local Importance were identified.

Following the implementation of mitigation, no potential for significant effects on Nationally designated sites were identified.

The mitigation described in this chapter will be implemented in full and it is therefore predicted that there will be no significant individual or cumulative effects on non-avian biodiversity at the international, national, county or local scales or on any of the identified KERs.



Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

Chapter 7 - Ornithology

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7. BIRDS

7.1 Introduction

This chapter assesses the likely significant effects of the proposed extension of operation of the existing Taurbeg Wind Farm (hereafter the "Proposed Lifetime Extension") on avian receptors. Particular attention has been paid to bird species with national and international protection under the Irish Wildlife Acts 1976-2022 and the European Union (EU) Birds Directive (2009/147/EC). Where potential impacts on avian receptors are identified, mitigation is described and the residual effects are assessed.

This chapter is supported by Technical Appendices 7-1 to 7-4, which contain data from the ornithological surveys undertaken at the Site, including full details of the survey effort, weather conditions and bird records. Confidential Appendix 7-5 contains sensitive records of protected species breeding sites. Appendix 7-7 presents the Proposed Hen Harrier Offsetting Plan. The Site and survey radii are provided in Figures 7-1 to 7-10.

The chapter is structured as follows:

- The Introduction provides a description of the Proposed Project and the relevant legislation, guidance and policy context (Section 7.1).
- The Assessment Approach and Methodology section is a comprehensive description of the ornithological surveys and impact assessment methodology used to inform a robust assessment of potential impacts of the Proposed Lifetime Extension on birds (Section 7.2).
- The Baseline Ornithological Conditions section describes the existing bird population at the Site (Section 7.3).
- The Receptor Evaluation section identifies key ornithological receptors and determines their sensitivity (Section 7.4).
- The Potential Impacts section details the impact assessment (including direct habitat loss, disturbance/displacement and collision risk). Impacts are described with regard to each phase of the Proposed Lifetime Extension: operation and decommissioning (Section 7.5).
- The Mitigation and Best Practice Measures section describes proposed mitigation and best practice measures to ameliorate the identified impacts (Section 7.6).
- The Monitoring section outlines a schedule for monitoring birds during each phase of the Proposed Lifetime Extension if planning permission is granted: operation and decommissioning (Section 7.8).
- The Residual Effects section considers the implications of the proposed mitigation, best practice, offsetting measures and monitoring (Section 7.9).
- Finally, the Cumulative Effects section fully assesses the potential cumulative effects of the Proposed Lifetime Extension in combination with other projects (Section 7.10).
- The Conclusion provides a summary statement on the overall significance of predicted effects on birds.

As detailed in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Lifetime Extension', 'the Site', 'Proposed Offsetting Measures', 'Proposed Offsetting Lands' and 'Proposed Project':

- Where the 'Proposed Lifetime Extension' is referred to, this relates to the continued 10-year operation of the existing Taurbeg Wind Farm from 2026. This includes all elements within the existing Taurbeg Wind Farm Site as shown in Figure 1-2 (Chapter 1).
- Where 'the Site' is referred to, this relates to the primary study area for the Proposed Lifetime Extension, as delineated by the EIAR Site Boundary in green and encompasses an area of approximately 112 hectares (ha) as shown in Figure 1-2 (Chapter 1).
- Where the 'Proposed Offsetting Measures' is referred to, this relates all works associated with the creation of new habitat in the townlands of Knockatee and Coom, Co. Kerry for the

purposes of offsetting the potential significant adverse effects on hen harrier due to the continued operation of Taurbeg Wind Farm.
- Where the 'Proposed Offsetting Lands' are referred to, this relates to the lands in which the Proposed Offsetting Measures will take place, encompassing an area of approximately 123.2 hectares (ha), including an area of 105.5ha of deforestation.
- Where the 'Proposed Project' is referred to, this relates to the Proposed Lifetime Extension and the Proposed Offsetting Measures. The Proposed Project is described in detail in Chapter 4: Description of the Proposed Project of this EIAR.

The following other definitions are used in this chapter:

- The "Zone of Influence" (ZOI) for individual ornithological receptors refers to the area within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular species and were assigned in accordance with best available guidance (SNH, 2016 and McGuinness *et al.*, 2015), adopting a precautionary approach.
- "Key Ornithological Receptor" (KOR) is defined as a species occurring within the zone of influence of the Proposed Lifetime Extension upon which potential impacts are anticipated and assessed.

7.1.1 Description of the Proposed Project

A full description of the Proposed Project is provided in Chapter 4 of this EIAR. The Proposed Project does not comprise any alterations to the existing operational wind farm. All elements of the existing wind farm are pre-existing and it is not proposed to make any alterations to the current site layout, wind turbines or associated infrastructure as part of this application.

7.1.2 Legislation, Guidance and Policy Context

This EIAR is prepared in accordance with the requirements of EU Environmental Impact Assessment Directive 2014/52/EU. The following key legislative provisions are applicable to habitats and fauna in Ireland:

- The Wildlife Act 1976. This Act was revised in October 2022 to present amendments since enactment.
- The Birds Directive (EU Directive 2009/147/EC on the conservation of wild birds)
- The European Communities (Birds and Natural Habitats) Regulations 2011, as amended (S.I. no. 477 of 2011). These regulations transpose the EU Birds Directive into Irish law. The regulations were amended in 2013 (290/2013 and 499/2013), 2015 (355/205) as well as Chapter 4 of the Planning, Heritage and Broadcasting (Amendment) Act 2021 (11/2021) and in 2021 (293/2021).
- The International Convention on Wetlands of International Importance (the Ramsar Convention), 1971. This convention protects 45 wetland sites of significant value for nature in Ireland.

In the absence of specific national ornithological survey guidance for Ireland, the following guidance documents published by NatureScot (formerly Scottish Natural Heritage [SNH]) have been followed to inform this assessment:

- SNH (2000). Wind farms and birds: calculating a theoretical collision risk assuming no avoidance action. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2017-09/Guidance%20Note%20-%20Windfarms%20and%20birds%20-%20Calculating%20a%20theoretical%20collision%20risk%20assuming%20no%20avoiding%20action.pdf
- SNH (2009). Monitoring the impact of onshore wind farms on birds. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2017-

09/Guidance%20Note%20-%20Monitoring%20the%20impact%20of%20onshore%20windfarms%20on%20birds.pdf

- SNH (2014) Repowering onshore wind farms: bird survey requirements;
- SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf
- SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-06/Guidance%20Note%20-%20Recommended%20bird%20survey%20methods%20to%20inform%20impact%20assessment%20of%20onshore%20windfarms.pdf
- SNH (2018a) Avoidance rates for the onshore SNH wind farm collision risk model. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-09/Wind%20farm%20impacts%20on%20birds%20-%20Use%20of%20Avoidance%20Rates%20in%20the%20SNH%20Wind%20Farm%20Collision%20Risk%20Model.pdf
- SNH (2018b). Assessing the cumulative impacts of onshore wind farms on birds. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-08/Guidance%20-%20Assessing%20the%20cumulative%20impacts%20of%20onshore%20wind%20farms%20on%20birds.pdf
- SNH (2018c). Assessing significance of impacts from onshore wind farms outwith designated areas. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/doc/guidance-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect-protected
- While the 'Assessing the impact of repowered wind farms in nature' (SNH, 2018d) is a NatureScot draft document, it has been considered

The following Irish guidance documents were also consulted:

- Percival, S.M. (2003). Birds and wind farms in Ireland: A review of potential issues and impact assessment. Ecology Consulting, Durham, UK. Available at: https://tethys.pnnl.gov/sites/default/files/publications/Percival_2003.pdf
- McGuinness, D., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S. and Crowe, O. (2015). Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland. Birdwatch Ireland, Wicklow, Ireland. Available at: https://birdwatchireland.ie/app/uploads/2019/09/BWI-Bird-Wind-Energy-devt-Sensitivity-Mapping-Guidance_document.pdf
- Gilbert, G., Stanbury, A. and Lewis, A. (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. *Irish Birds,* 43:1-22. Available at: https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/

Furthermore, this assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below and those listed in Chapter 1 of this EIAR:

- European Commission (2002) Assessment of plans and projects significantly affecting Natura 2000 sites. Publications Office of the European Union, Luxembourg.
- European Commission (2020) Guidance document on wind energy developments and EU nature legislation. Publications Office of the European Union, Luxembourg.
- European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Part 1 and 2.Planning and Development Acts 2000 (as amended).
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority, Ireland.
- EPA (2022). Guidelines on the information to be contained in Environmental Impact Statement reports. Environmental Protection Agency, Johnstown Castle Estate, Wexford.

- DoHPLG (2018). Guidelines for planning authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. Department of Housing, Planning and Local Government, Government of Ireland, Dublin.

7.1.3 Statement of Authority and Competence

This ornithology chapter has been prepared by Donnacha Woods (M.Sc.), Senior Ornithologist of MKO and reviewed by Padraig Cregg (M.Sc), Principal Ornithologist. Both are suitably qualified ornithologists with experience in completing avifaunal assessments and competent experts for the purposes of the preparation of this EIAR. Further details of their experience are included in Chapter 1, Section 1.9, of this EIAR. The scope of works and survey methodology was devised by Padraig Cregg and is compliant with recent NatureScot (formerly Scottish Natural Heritage) guidance (SNH, 2014, 2017). Field surveys were undertaken by Ciaran McKenna, Conor Rowlands, Edward Carty and Thalie Konstantinidis. Surveyors are competent experts for the purposes of undertaking the required surveys.

7.2 Assessment Approach and Methodology

7.2.1 Desk Study

A comprehensive desk study was undertaken to search for any relevant information on species of conservation concern that may use the Site. The assessment included a thorough review of the available ornithological data listed below and presented in Sections 7.3.1 to 7.3.12:

- Designated sites within the likely ZOI of the Proposed Lifetime Extension. A definition of the ZoI is provided in Section 7.1.
- Bird atlases.
- Bird sensitivity mapping tool.
- Irish Wetland Bird Survey data.
- Review of specially requested records from the National Parks and Wildlife Service Rare and Protected Species Database.
- National Breeding Hen Harrier Survey (2022).
- Hen Harrier Threat Response Plan 2024-2028.
- Conservation Objectives Supporting Document: Breeding Hen Harrier.
- Hen Harrier Programme Monitoring Data 2021.
- Taurbeg Wind Farm Post-Construction Hen Harrier Monitoring Reports 2006-2009.
- Knockacummer & Glentane Wind Farms Post-Construction Monitoring Reports.

7.2.2 Consultation

Consultation was undertaken with the relevant statutory and non-statutory organisations as part of the EIAR scoping to inform the current assessment. Full details of the EIAR scoping exercise are included in Chapter 2 of this EIAR.

Table 7-1 Consultation responsesTable 7-1 below provides a list of the organisations consulted relevant to ornithology during the scoping exercise and describes where any comments raised in the scoping responses received in relation to birds have been addressed in this Chapter.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter; Chapter 2 describes where the comments raised in the scoping responses received have been addressed within this EIAR.

Table 7-1 Consultation responses

	Consultee	Response
01	An Taisce	No response received.
02	BirdWatch Ireland	BWI requested environmental monitoring reports since the initiation of the wind farm with particular refence to bird monitoring reports. The available bird monitoring reports are summarised and discussed in this Section 7.3.10. BWI noted the Threat Response Plan for Hen Harrier being adopted by Government soon. The Hen Harrier Threat Response Plan 2024-2028 is discussed in Section 7.3.8.
03	Cork County Council	Response received commenting on what should be included as part of the EIA. In relation to birds the following comment was received:

	Consultee	Response
		"*The EIA should include an assessment of the impact on bird populations resulting from the developments operational phase, with expert evidence of impact to support the continued operation*". Two pre-application meetings were also undertaken (refer to Chapter 2, Section 2.10.2, of this EIAR for details.
04	Department of Agriculture, Food and the Marine	Response received outlining requirements in the event of tree felling being proposed. No correspondence relating to birds received.
05	Department of Communications, Climate Action and the Environment	No response received.
06	Development Applications Unit (NPWS/NMS)	Response received on 16/02/2024 acknowledging receipt of EIA scoping request. A consultation reference number was provided on 28/02/2024. No further correspondence was received in relation to EIA scoping. Consultation with NPWS regarding the Proposed Offsetting Plan is summarised in Section 7.2.2.1 below.
07	Inland Fisheries Ireland	No response received.
08	Irish Red Grouse Association	No response received.
09	Irish Raptor Study Group	No response received.
10	Irish Wildlife Trust	Response received stating IWT does not have the staff capacity to respond to consultation.
11	Waterways Ireland	Response received stating Project is not within Zone of Influence of Waterways Ireland waterways so they will not be commenting.

7.2.2.1 National Parks and Wildlife Service (NPWS)

Consultation was carried out with NPWS staff working in the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, as summarised below:

- May 2024 - A virtual meeting was held with the District Conservation Officer for the area. The project was introduced and potential offsetting measures were discussed, although at this point no lands had been identified.
- October 2024 – Email correspondence inviting NPWS for site visit to Proposed Offsetting Lands.
- February 2025 – Email correspondence regarding site visit with date proposed. NPWS staff unable to make date and indicated that site visit would not be possible in the short-term. NPWS staff requested map of Proposed Offsetting Lands which was provided by MKO via email for comment.
  NPWS staff recommended confirming that the Proposed Offsetting Lands are not already a mitigation area for another nearby wind farm. This was confirmed by MKO via email.
- May 2025 – Email received from Conservation Ranger working in the SPA requesting to meet regarding the Proposed Offsetting Plan. MKO subsequently responded to this email requesting availability for meeting. This was replied to with email stating that Conservation Ranger had

been informed of the previous meeting taking place in May 2024, and that meeting will therefore not be taking place.

Consultation regarding Proposed Offsetting Measures

A virtual meeting was held in relation to the Proposed Offsetting Measures on 29th May 2025, following a request for meeting. In attendance were NPWS senior staff from the Ecological Guidance and Advisory Unit, in addition to the District Conservation Officer and Divisional Ecologist from the geographical area of Taurbeg Wind Farm.

MKO gave a presentation outlining the Proposed Lifetime Extension, including a summary of likely conclusions of the EIAR and NIS, and presented the Proposed Offsetting Measures. Please see Chapter 2 for further information.

7.2.3 Identification of Target Species and Key Ornithological Receptors

Following a comprehensive desk study, initial site visits and consultation, a list of "target species" likely to occur in the ZOI of the Site was compiled. Bird surveys conducted at the Site were then specifically designed to survey these target species, in accordance with SNH (2017). The target species list was drawn from:

- Species listed on Annex I of the EU Birds Directive.
- Special Conservation Interests (SCI) of Special Protection Areas (SPA) within the zone of likely significant effects.
- Red listed Birds of Conservation Concern in Ireland (BoCCI).
- Raptors and species that are particularly sensitive to wind farm developments.

Following analysis of field survey data (described below), a precautionary screening approach was followed to identify KORs: the list of target species observed during surveys (see Appendix 7-1) was refined to KORs, excluding those for which pathways for a significant effect could not be identified.

7.2.4 Field Surveys

Vantage point surveys were undertaken by Ecology Ireland during the survey period April 2023 – September 2023, consisting of one breeding season.

Field surveys were undertaken by MKO during the survey period November 2023 – September 2024, consisting of one breeding seasons (April – September) and one non-breeding seasons (October – March). These field surveys were undertaken in compliance with NatureScot guidance (SNH, 2017).

Data from these surveys have been included in this chapter.

7.2.4.1 Initial Site Assessment

There is little published information on the survey requirements for an extension of life application for a wind farm, there are however several guidance documents outlining survey recommendations for pre-planning (green field) wind farm sites and repowering projects. These documents (outlined below) have informed the survey scope.

In the absence of specific national ornithological survey guidance for Ireland, the NatureScot, formerly Scottish Natural Heritage, guidelines is widely accepted to provide industry best practice recommendations. These documents include:

- Repowering onshore wind farms: bird survey requirements' (SNH, 2014);
- While the 'Assessing the impact of repowered wind farms in nature' (SNH, 2018) is a NatureScot draft document, it has been considered;
- Recommended bird survey methods to inform impact assessment of onshore wind farms' (SNH, 2017);
- Monitoring the impact of onshore wind farms on birds (SNH, 2009); and
- Assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016).

Based on the results of the desk study, consultation and reconnaissance site visits undertaken in November 2023, the likely importance of the Site for bird species was ascertained. Based on the collated information available from the above preliminary assessment and adopting a precautionary approach, a site-specific survey scope for the ornithological survey was developed.

Field survey methodologies were devised to survey for the bird species composition and assemblages that occur within the Site and its surroundings. The study area surveyed for each type of survey is discussed in the methodology section below. The survey locations / areas are shown in Figures 7-1 to 7-10. The survey radii mentioned below are discussed in relation to the turbine layout.

7.2.4.2 Survey Methodologies

7.2.4.2.1 *Vantage Point Surveys*

Vantage point surveys were undertaken by MKO, between November 2023 and September 2024, in accordance with SNH (2017) to monitor flight activity within the Site and to a 500m radius of the turbine positions. Surveys were conducted from four fixed point vantage points with comprehensive coverage of the Site (Figure 7-1). The vantage point locations were selected by undertaking a viewshed analysis (described below) and confirmed by a reconnaissance visit and initial field surveys to ensure that the existing turbine layout was entirely covered/visible.

Viewshed Analysis

The viewshed analysis aims to identify the most suitable locations to site vantage points such that the airspace of the turbine rotor swept area is in view using the fewest possible number of vantage points. Viewsheds were calculated using the Visibility Analysis plugin (Version 1.8) over a raster digital elevation model (DEM) in QGIS (Version 3.28) using a notional layer suspended at 26m, which is representative of the minimum height considered for the Potential Collision Risk Area based on the existing turbine model (i.e. 25.8m).

The vantage point location was tested for visibility coverage of the existing turbines and to a 500m radius of the outermost turbines in line with SNH (2017). The viewshed analysis was undertaken by creating a viewshed point 1.75m in height (to represent the height of the observer) on a map using a 25m resolution digital terrain model (DTM). The relative height of any surrounding vegetation and its effects on visibility was recorded during a site visit and is also accounted for in the analysis. Using QGIS (Version 3.28), a viewshed of 360° was produced calculating an area 26m from ground level up to a 2km radius. The resulting viewshed image was then cropped to 180° to give the viewshed. A 500m buffer was applied to the outer most turbines of the Site. The visible viewshed at 26m is presented in Figure 7-2.

Data Recording and Digitisation

Survey methodology followed SNH (2017). The surveyor collected data on bird observations and flight activity from the scanning arc of 180° to a 2km radius at the fixed vantage point locations for two 3 hour watches separated by a minimum 30 minute break (i.e. 6 hours total) per month. Surveys were conducted from November 2023 to September 2024 inclusive, and were scheduled to provide a

minimum of 36 hours per winter or breeding season and spread over the full daylight period, including dawn and dusk watches, to coincide with the highest periods of bird activity.

Survey effort for vantage point watches is presented in Appendix 7-2, Table 1. This includes full details of dates, times, survey locations, survey duration and weather conditions for each survey. Table 7-2 below shows a summary of the VP survey work undertaken.

Table 7-2 Vantage point survey watch duration

Survey Season and Number of Vantage Points (VPs)	Effort per Vantage Point (VP)
Winter Season 2023/2024 (4 VPs)	36 hours per VP[1]
Breeding Season 2024 (4 VPs)	36 hours per VP

Flight activity of target species was mapped and recorded as per defined flight bands which were chosen in relation to the dimensions of the turbine model installed at the Site. Bands were split into 0-15m, 15-26m, 26-108m, 108-200m and >200m. All flight activity within a height band 26-108m is considered to be within the Potential Collision Height (PCH) as the turbine swept area of the existing turbine dimension overlaps with this height band. Please see Appendix 7-6 for further detail. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat. Each flight observation was assigned a unique identifier when mapped in the field and subsequently digitised using GIS software.

7.2.4.2.2 Vantage Point Surveys 2023

Ecology Ireland carried out vantage point surveys at the Site during the 2023 breeding season (April – September 2023 inclusive) and overlooking areas away from the turbines. Surveys were undertaken from six locations. Surveys were carried out for 6 hours at each VP location in each month (April – September) providing a total of 36 hours per VP for the season. Vantage point survey locations used during the 2023 breeding season are shown in Figure 7-3.

7.2.4.2.3 Breeding Walkover Surveys 2024

Breeding walkover surveys were undertaken by MKO in 2024 to determine possible, probable or confirmed breeding bird activity within the Site and within a 500m radius of the turbine layout. The methodology was based on Brown and Shepherd (1993) and Calladine *et al.* (2009), combined with Common Bird Census methods (British Trust for Ornithology, 2021) for dense habitat. Transect routes were walked across different habitat complexes within the survey area where access allowed. Using binoculars, the surveyor regularly scanned the surroundings of each transect for target species. All target species were mapped and breeding status was assigned following British Trust for Ornithology (BTO) breeding status codes (https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence). In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat. Transect routes were devised to ensure the required coverage of different habitats was achieved within the survey area.

Breeding walkover surveys were carried out during daylight hours during the core breeding season months April to July 2024, with the Site being visited two days per month on each occasion. The timing of visits followed the recommendations of Calladine *et al.* (2009). Following all survey visits, the field maps were analysed to determine the number and location of breeding territories. All non-breeding individuals and species encountered were also recorded.

[1] *30 hours completed at VP4 in winter 2023/24.*

The survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey. Figure 7-4 shows the survey transects.

7.2.4.2.4 Breeding Raptor Surveys 2024

Breeding raptor surveys were undertaken by MKO in 2024 within the Site and within a 2km radius of the turbine layout to identify occupied territories and monitor their breeding success near or within the Site. Raptors include all harrier, falcon, buzzard, eagle, hawk, owl, kite and osprey species. Survey methodology followed Hardey *et al.* (2013). Raptor surveys were undertaken in the form of short vantage point watches and walked transects. All raptor species observed were recorded and mapped and breeding status was assigned following BTO breeding status codes. Surveyors did not approach nest sites to avoid disturbance.

Each breeding raptor location was surveyed once per month during the core breeding season between April and July 2024. Each round of surveys was undertaken over four days, this allowed sufficient time to survey the key areas of suitable habitat within the survey area.

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-5 shows the breeding raptor locations.

Proposed Offsetting Lands

Breeding raptor surveys at the Proposed Offsetting Lands are on-going in breeding season 2025, comprising 2no. vantage point locations, to confirm hen harrier occurrence locally.

7.2.4.2.5 Breeding Woodcock Surveys 2024

Breeding woodcock surveys were undertaken by MKO in 2024 in accordance with Gilbert *et al.* (1998). Surveys were undertaken at the Site in May and June 2024. The survey area extended 500m beyond the turbine layout and was focused on areas of suitable habitat. Surveys commenced one hour before sunset and continued for one hour after sunset or until it was too dark to see, as per Gilbert *et al.* (1998). Transects were slowly walked through areas of suitable woodland/forestry habitat onsite and to a 500m radius of the Site. All observations of woodcock (as well as the areas covered) were mapped. The survey aimed to record the presence of roding (displaying) male woodcock and thereby establish the distribution and abundance of the species in the surveyed area. This survey method also allowed the observer to survey for owls, i.e. barn owls and long-eared owls.

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-6 shows the transect routes.

7.2.4.2.6 Breeding Nightjar Surveys 2024

Breeding nightjar surveys were undertaken by MKO in 2024 in conjunction with breeding woodcock surveys. Surveys were undertaken at the Site and to a 500m radius of the turbine layout in areas of suitable habitat in June 2024. These surveys were undertaken following an incidental sighting of a nightjar during a breeding woodcock survey in May 2024.

Survey methodology follows Gilbert *et al.*, (1998). The surveyor walked transects through suitable breeding habitat. Two survey rounds were completed, one in early-June and one in late-June. The early-June survey round visits commenced one hour after sunset and continued for 30 minutes to an hour. The late-June survey round visits commenced one hour before sunset and continued for an hour after sunset or until it was too dark to see. The survey aimed to record the presence of churring/singing (displaying) male nightjar and thereby establish the distribution and abundance of the species in the survey area.

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey. Figure 7-7 shows the transect routes.

7.2.4.2.7 Breeding Red Grouse Surveys 2024

Breeding red grouse surveys were undertaken by MKO in 2024 within the Site and to a 500m radius of the turbine layout in February 2024. The survey aimed to identify breeding red grouse territories within the Site by using an auditory lure of a recording of a 'rival' red grouse male to elicit a response from the territory holder within the survey area.

Survey methodology followed Cummins *et al.* (2010a): the surveyor walked transects approximately 150m apart through suitable bog and heath habitat, where access allowed, stopping every 100m to broadcast lure calls for 30 seconds and listening for responses. Call-back and flying by the territory holder in response to the lure were recorded and mapped. The survey was conducted in February 2024 which is within the recognised period for undertaking breeding red grouse surveys (i.e. December to March, as per Cummins *et al,* (2010)) and all surveys were conducted under National Parks and Wildlife Service license.

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-8 shows the transect routes.

7.2.4.2.8 Winter Walkover Surveys

Winter walkover surveys were undertaken by MKO in winter 2023/24 to record the presence of bird species within the Site within a 500m radius of the turbine layout, including areas between vantage point locations. The methodology was adapted from the breeding walkover methodology outlined in Brown and Shepherd (1993) and Calladine *et al.* (2009), combined with Common Bird Census methods (British Trust for Ornithology, 2021). Transect routes were walked across different habitat complexes within the survey area where access allowed. All target species were recorded and mapped. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat. Surveys were conducted in daylight hours over four visits between November 2023 and March 2024.

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey. Figure 7-9 shows the transect routes.

7.2.4.2.9 Hen Harrier Roost Surveys

Hen harrier roost surveys were undertaken by MKO in winter 2023/24 within the Site and within a 2km radius of the turbine layout in areas of suitable habitat. These surveys aimed to identify active winter hen harrier roosts near or within the Site. Survey methodology followed Gilbert *et al.* (1998) and O'Donoghue (2019). Roost watches of 2-3 hours were conducted at three hen harrier vantage point locations from dusk until last visible light during which all hen harrier observations were recorded and mapped. Each hen harrier vantage point was surveyed a minimum of once per month during the winter season between November 2023 and March 2024 inclusive.

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-10 shows the hen harrier vantage point locations.

7.2.5 Collision Monitoring

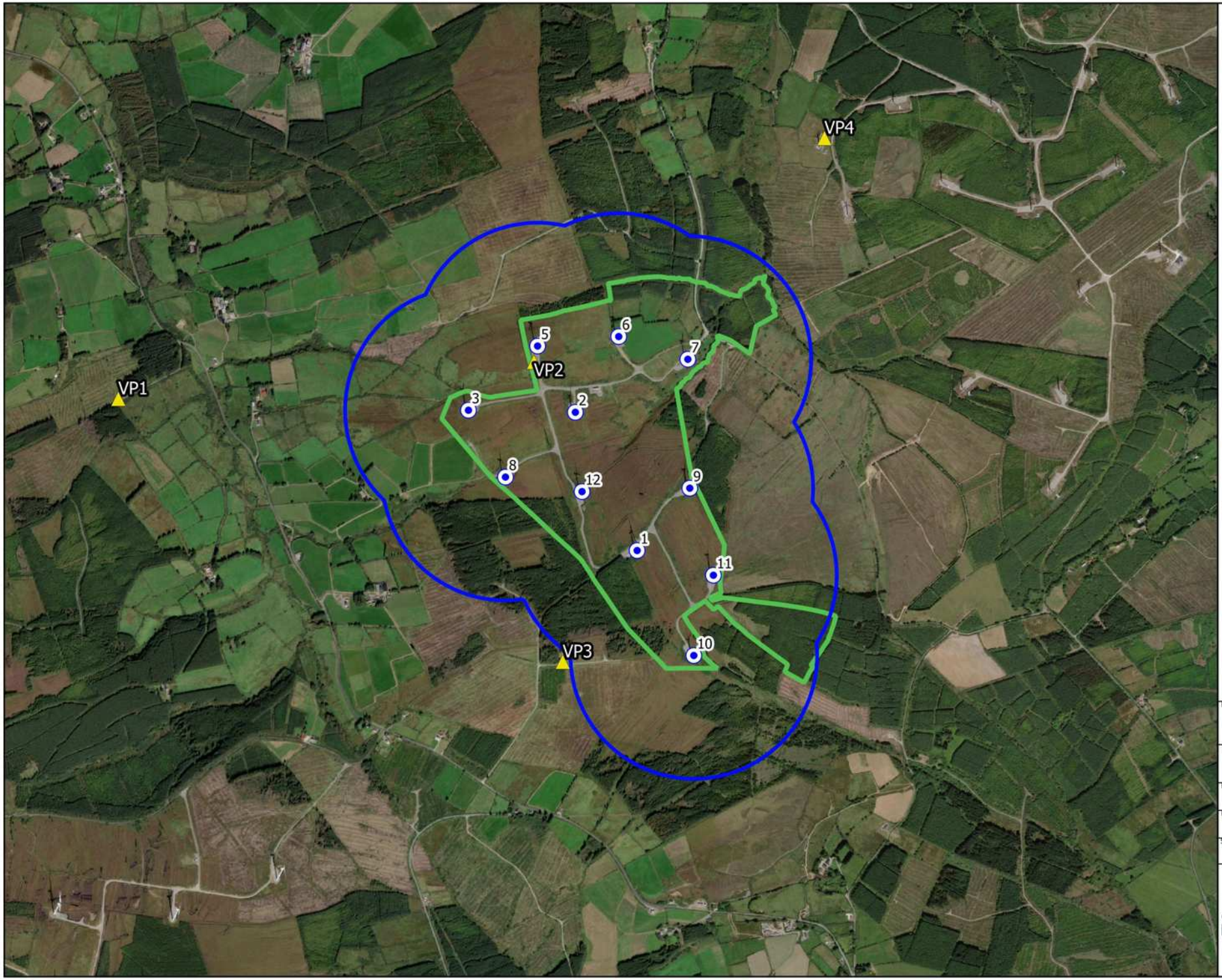
Collision monitoring was conducted at the Site to estimate the number of individual birds and bats killed by collision with moving wind turbine rotor blades. All 11 no. turbines which exist on the Site were surveyed once per month from January 2024 to May 2025 following a standardised dog-led carcass search methodology recommended by Bennet (2015). A 100m-by-100m (50m radius) plot centred on the turbine bases was searched for an average of 60 minutes per month and all bird and bat

carcasses detected within were recorded. If the cause of death was not apparent, the fatality was conservatively attributed to a collision with turbine blades.

The Taurbeg Windfarm consists of 11 Bonus (now Siemens) SWT-2.3-82 turbines with a rotor diameter of 82.4m. A search area covering a minimum search radius of 50m from the base of each turbine is proposed in accordance with guidance recommended by Rodrigues 2015 that the search area surrounding each wind turbine varies a radius of no less than 50m is necessary.

To ensure a more accurate estimation of the total number of fatalities, dog-led searches were calibrated to account for the dog's ability to find bird and bat carcasses (searcher efficiency) and the likelihood of carcasses not being found due to scavenging by other animals (scavenger removal).

The searcher efficiency trials were carried out at randomly chosen times during the survey cycle by planting a mixture of bird and bat carcasses within the site and allowing the dog and trainer team(s) to search for them. Searcher efficiency was then based on the percentage retrieval success. One worker left carcasses within the various habitats proportional to habitat representativity in the search area, and the dog and trainer team searched for them in the following hours. This time period aided in hiding any scent of the worker laying the carcasses and allowed a double-blind test to be conducted where the detection team is unaware of the carcasses location or number of carcasses placed in order to simulate as accurately as possible a survey without handler's bias. Full survey methodology, including survey effort, is provided in Appendix 7-6.



Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Vantage Point Locations

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Drawing Title

Vantage Point Locations

Project Title: Taurbeg Wind Farm Extension of Operational Life	
Drawn By: D. Woods	Checked By: P. Cregg
Project No.: 231030	Drawing No.: Fig. 7-1
Scale: 1:20,000	Date: 17.04.2025

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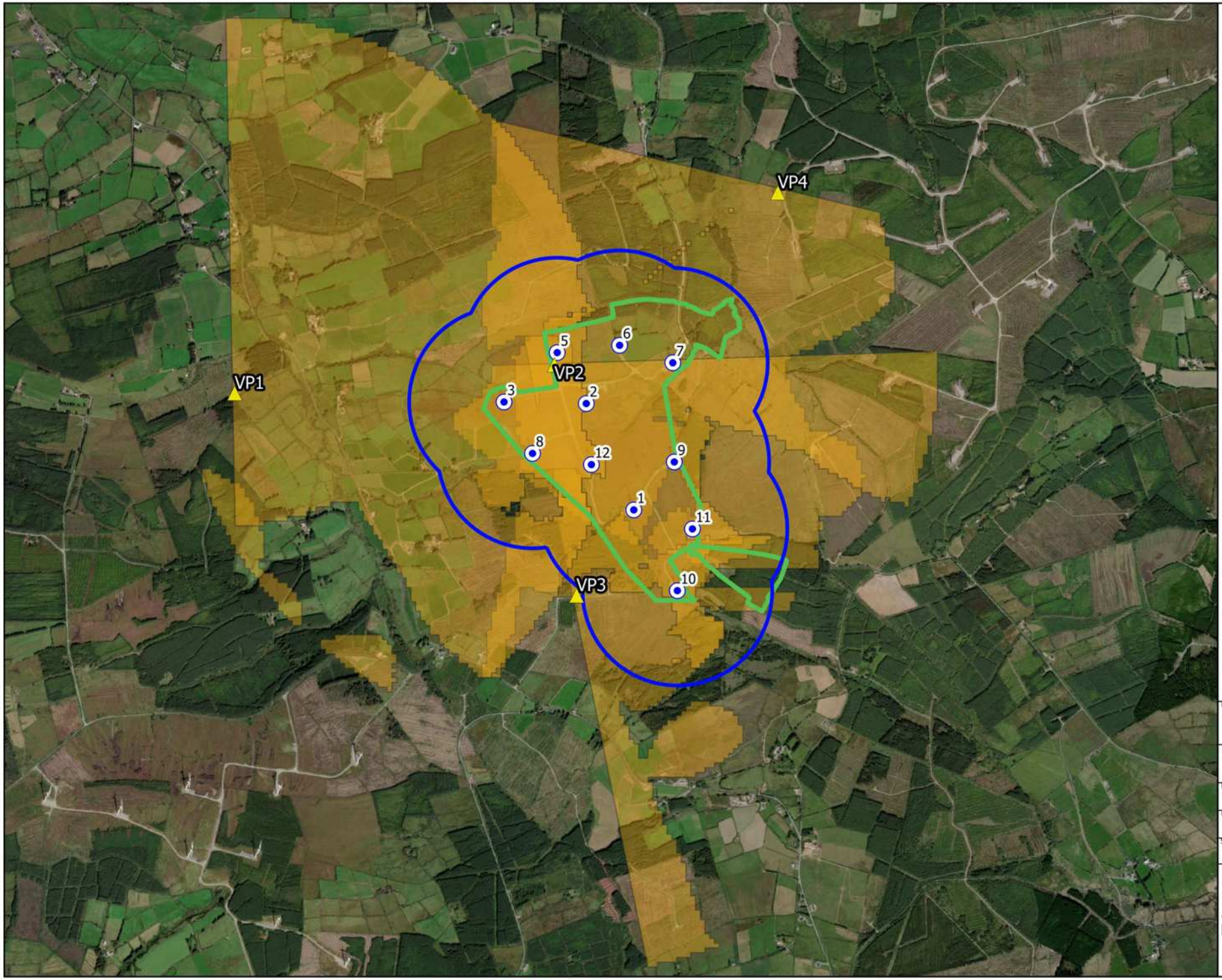

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Vantage Point Locations
- Viewshed Coverage

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Drawing Title

Viewshed Coverage at 26m

Project Title

Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
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Project No.	Drawing No.
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Scale	Date
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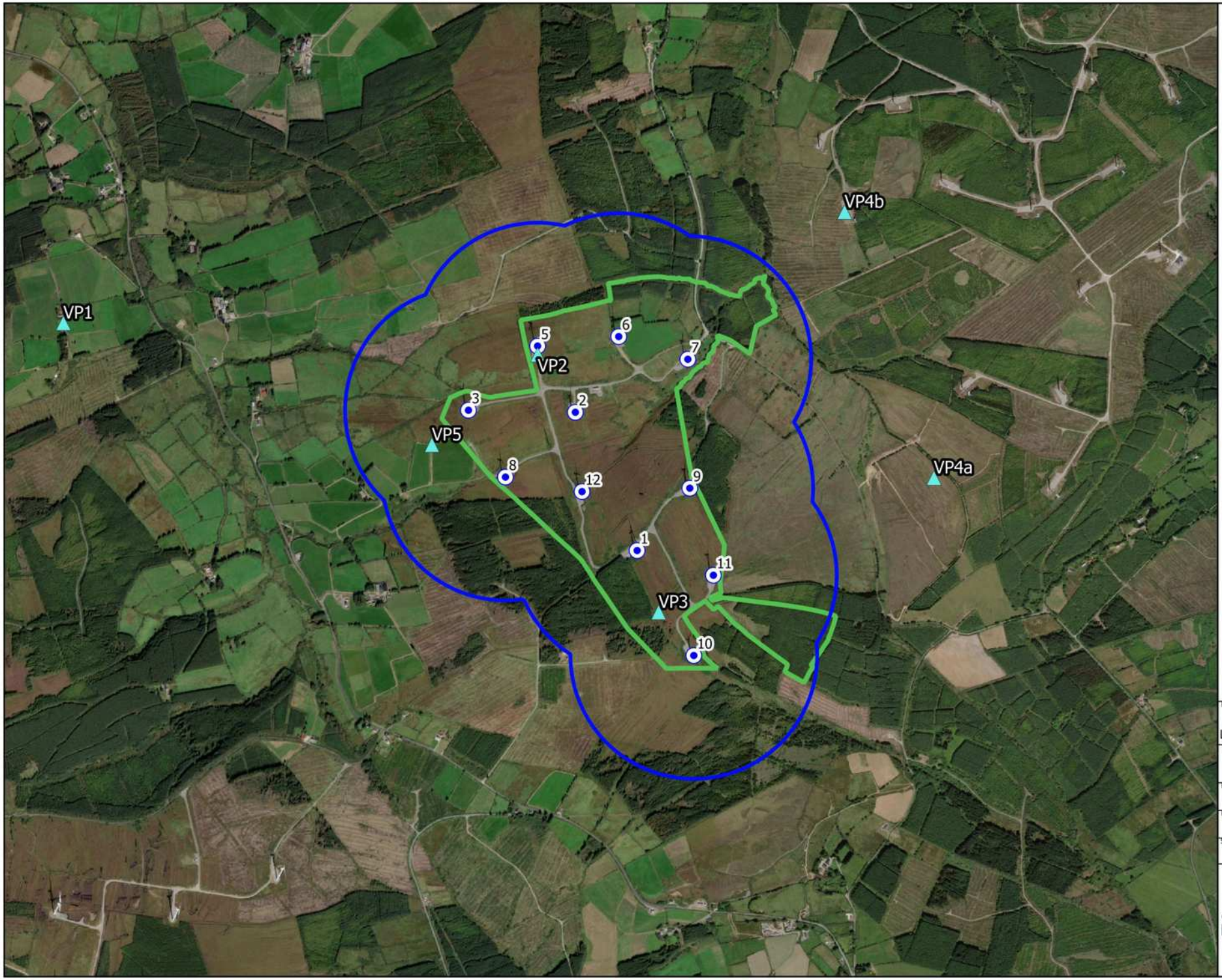

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Ecology Ireland Vantage Point Locations

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Drawing Title
Ecology Ireland Vantage Point Locations (Breeding Season 2023)

Project Title
Taurbeg Wind Farm Extension of Operational Life

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Project No.	Drawing No.
231030	Fig. 7-3
Scale	Date
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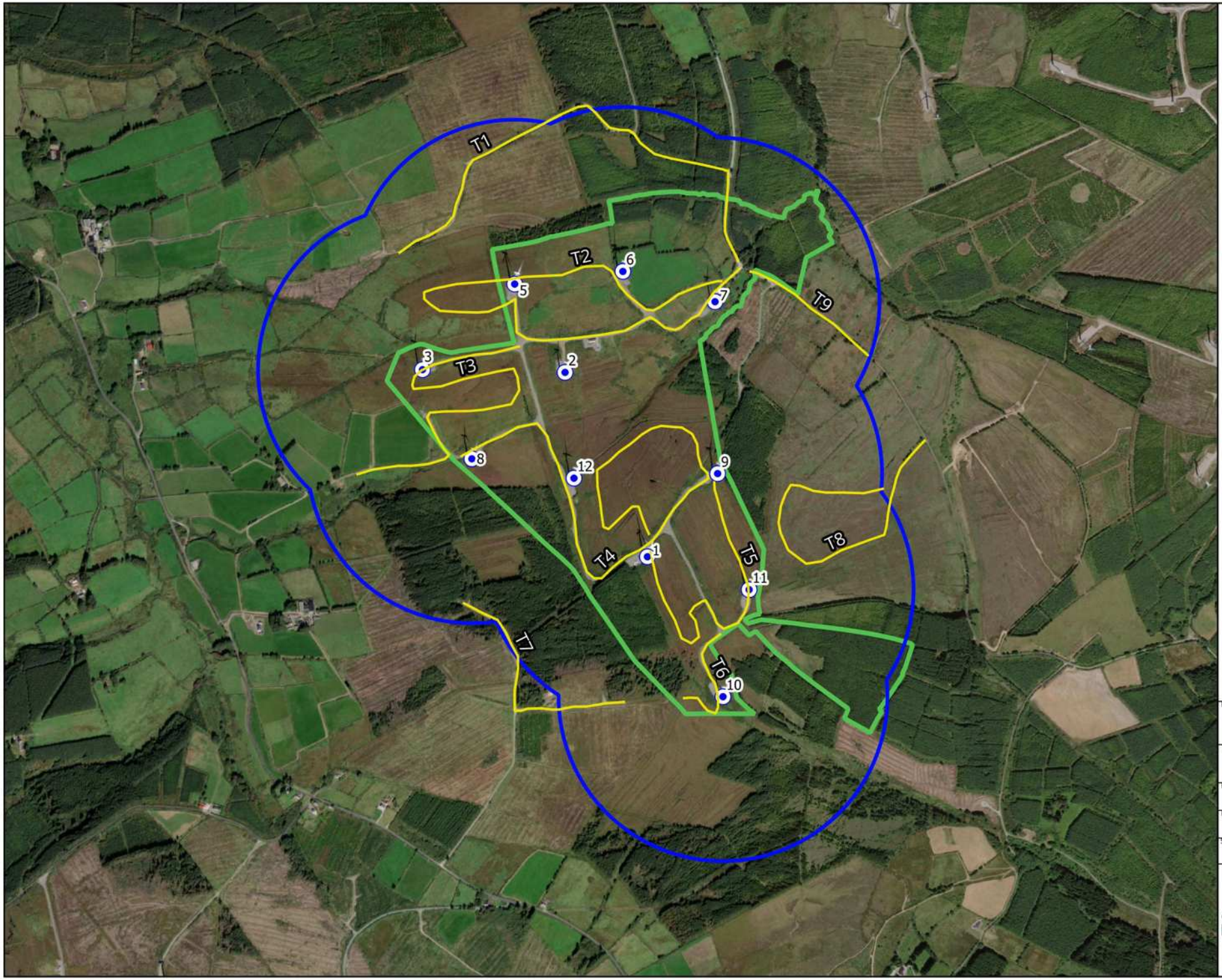

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Transects

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Drawing Title

Breeding Walkover Transects

Project Title

Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
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Project No.	Drawing No.
231030	Fig. 7-4
Scale	Date
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Map Legend

- EIAR Site Boundary
- Turbine Locations
- 2km Turbine Radius
- Breeding Raptor Survey Locations

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Drawing Title

Breeding Raptor Survey Locations

Project Title: Taurbeg Wind Farm Extension of Operational Life	
Drawn By: D. Woods	Checked By: P. Cregg
Project No.: 231030	Drawing No.: Fig. 7-5
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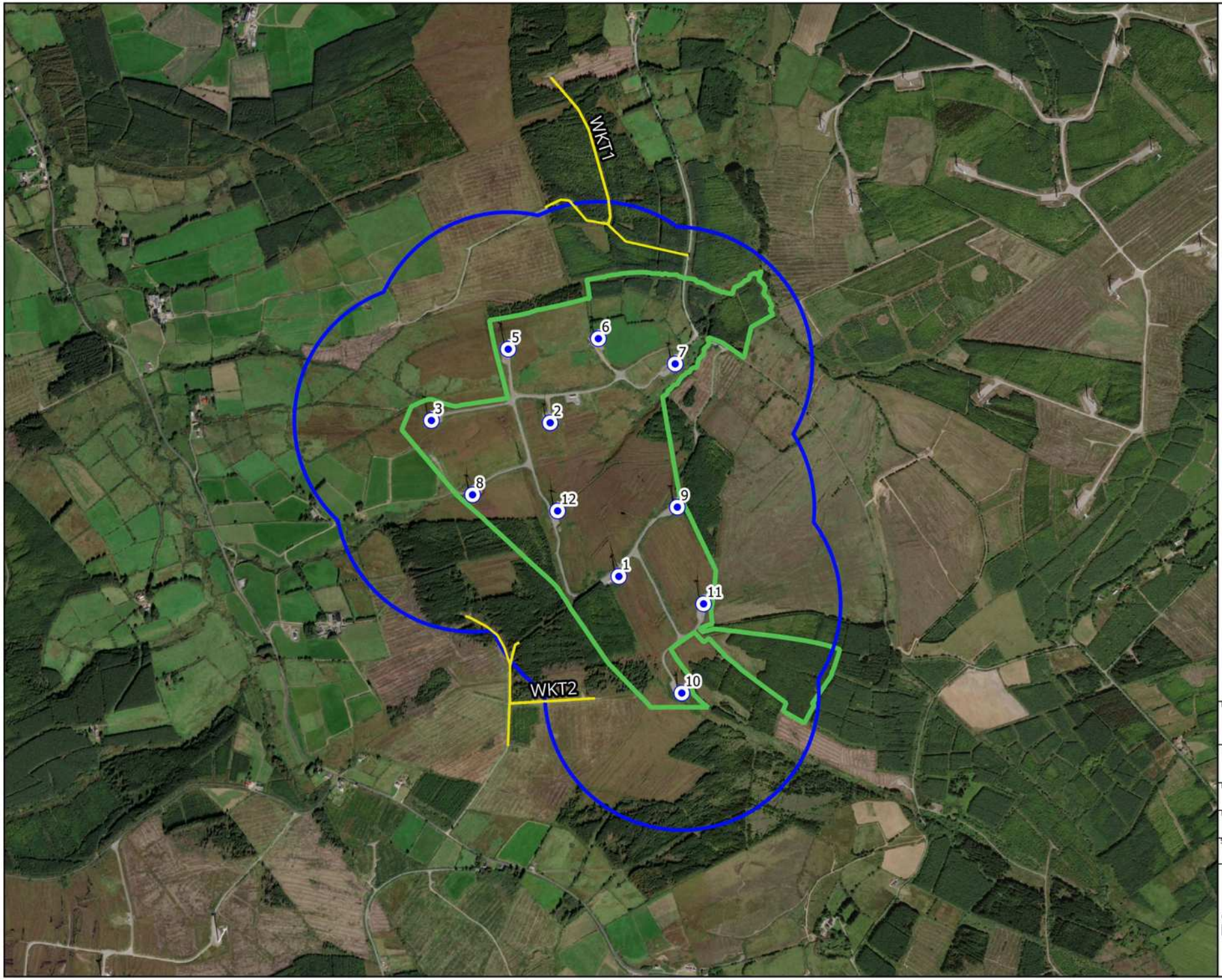

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Transects

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Drawing Title

Breeding Woodcock Transects

Project Title: Taurbeg Wind Farm Extension of Operational Life	
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Project No.: 231030	Drawing No.: Fig. 7-6
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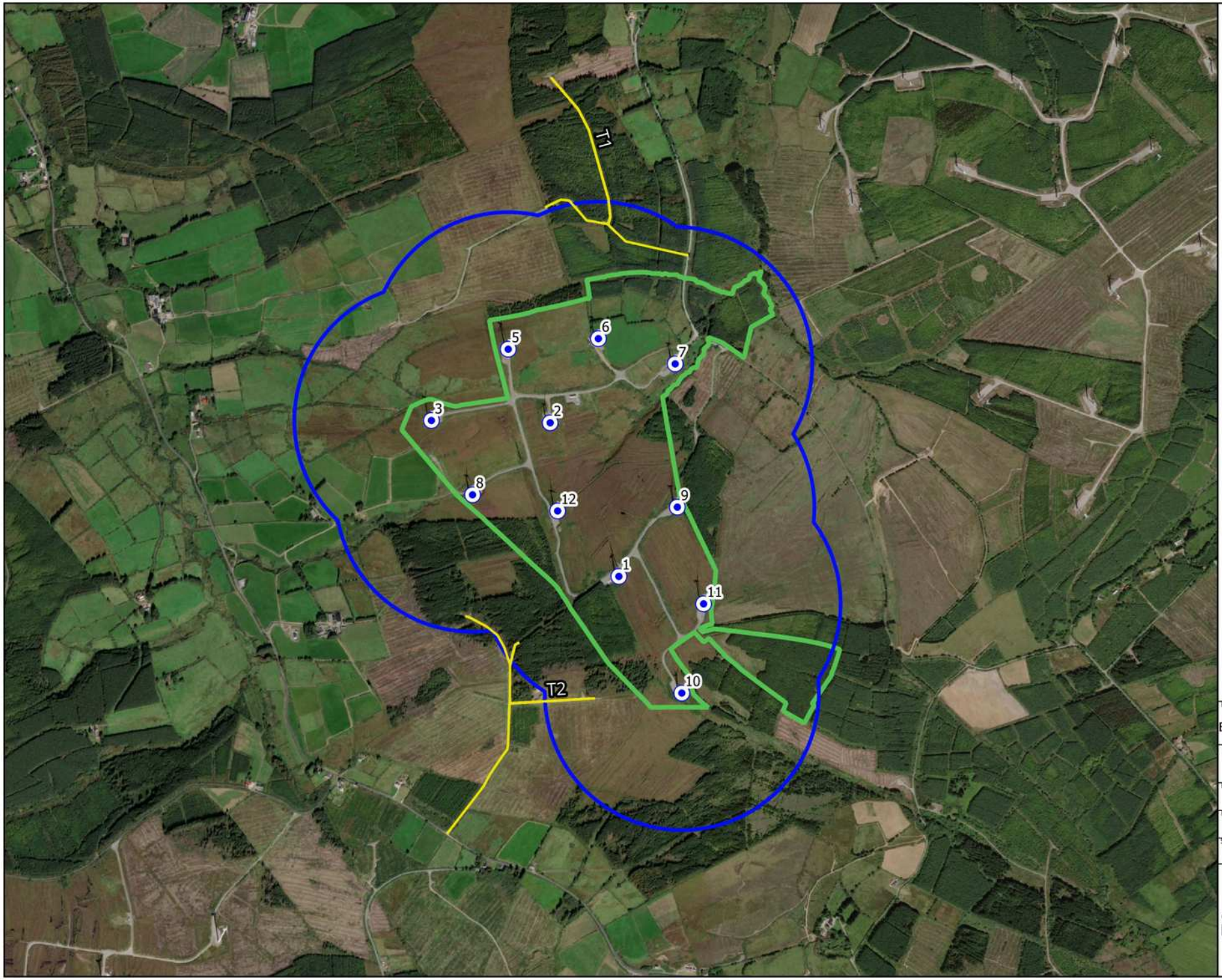

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Transects

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Drawing Title

Breeding Nighjar Survey Transects

Project Title	Taurbeg Wind Farm Extension of Operational Life
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Project No.: 231030	Drawing No.: Fig. 7-7
Scale: 1:18,000	Date: 17.04.2025

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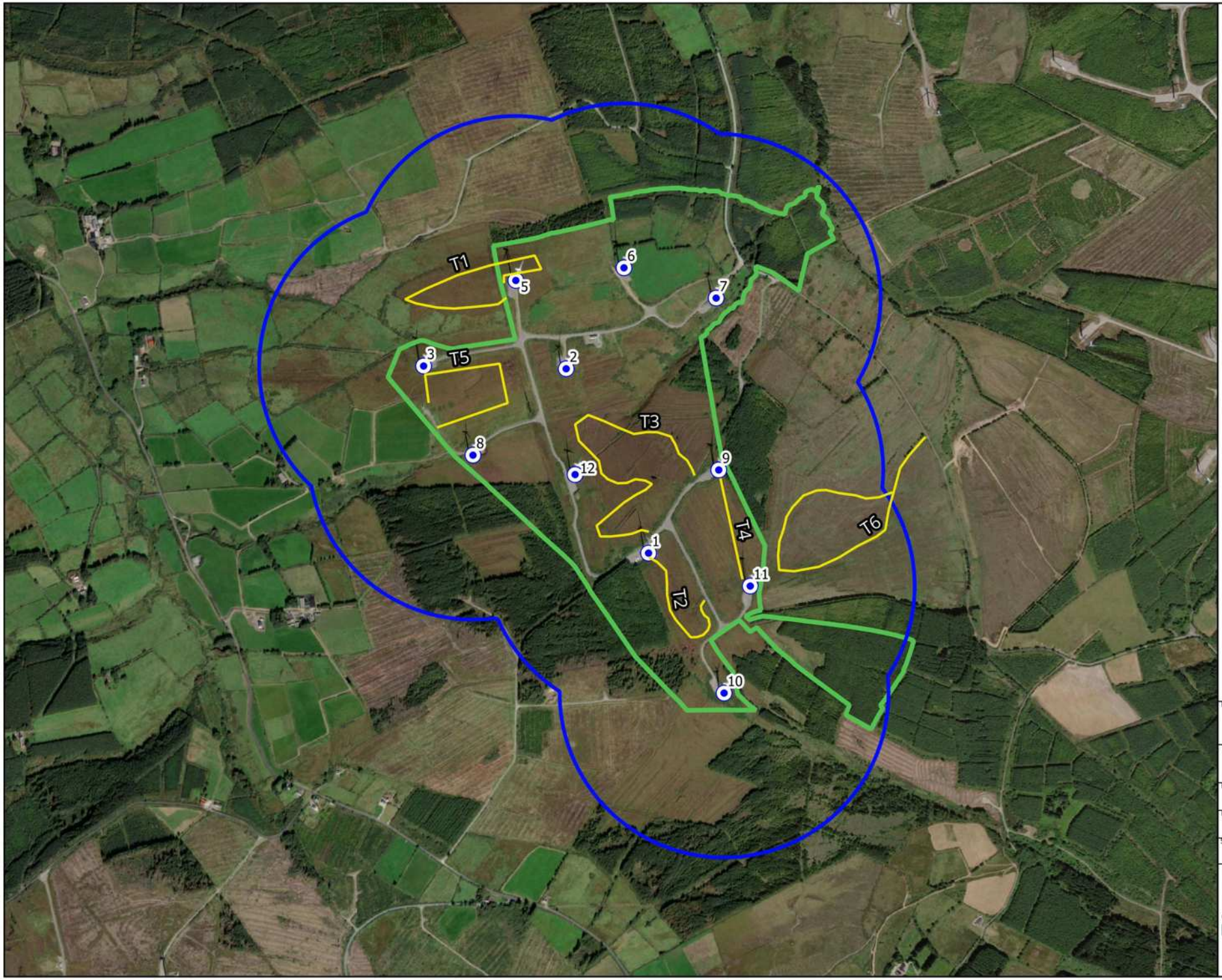

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Transects

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Drawing Title: Breeding Red Grouse Survey Transects

Project Title: Taurbeg Wind Farm Extension of Operational Life

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Project No.	Drawing No.
231030	Fig. 7-8
Scale	Date
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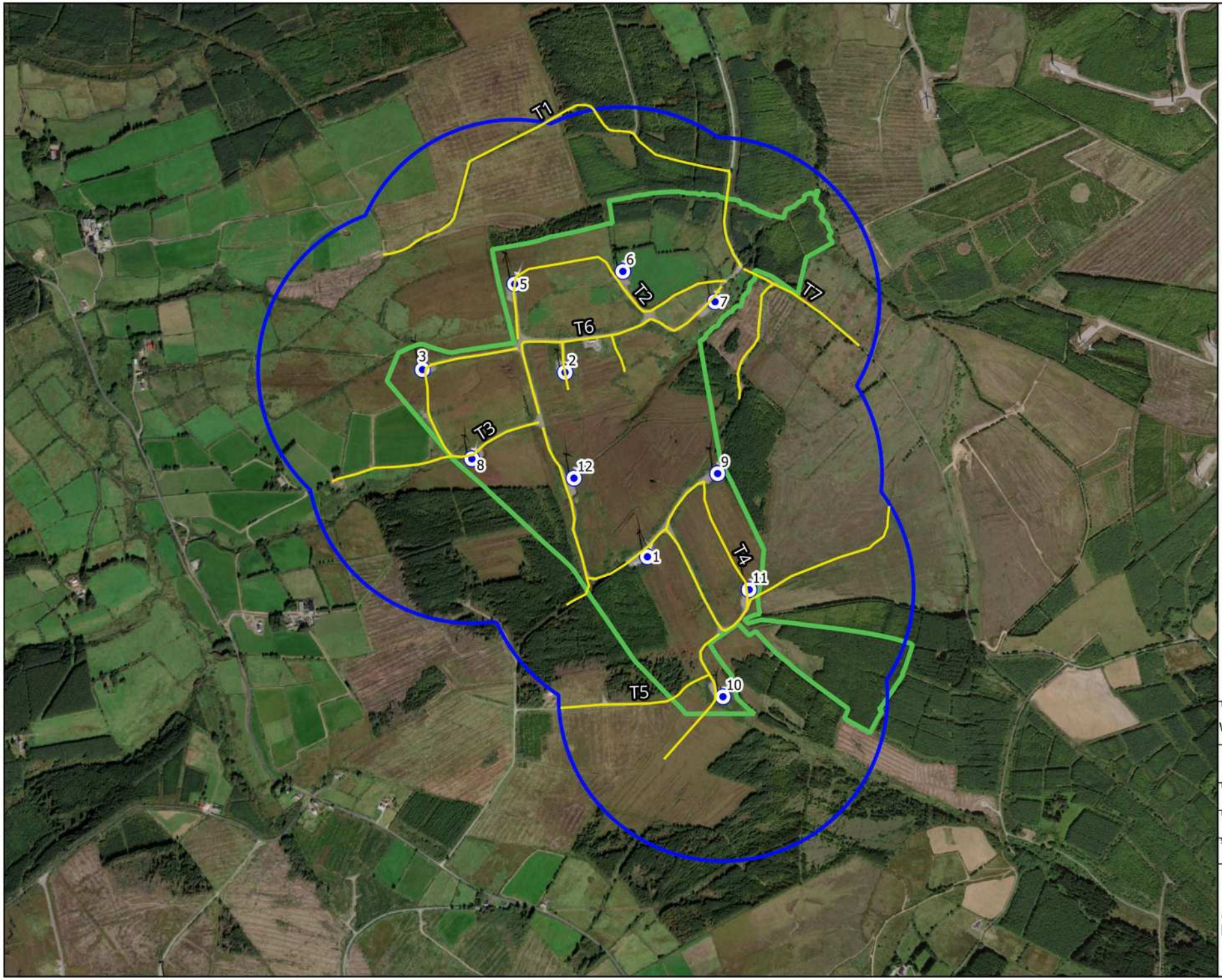

Map Legend

- EIAR Site Boundary
- Turbine Locations
- 500m Radius of Turbine Locations
- Transects

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Drawing Title

Winter Walkover Survey Transects

Project Title	
Taurbeg Wind Farm Extension of Operational Life	
Drawn By: D. Woods	Checked By: P. Cregg
Project No.: 231030	Drawing No.: Fig. 7-9
Scale: 1:15,000	Date: 17.04.2025

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Map Legend

- EIAR Site Boundary
- Turbine Locations
- 2km Turbine Radius
- Survey Locations

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Drawing Title
Hen Harrier Roost Survey Locations

Project Title
Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
D. Woods	P. Cregg
Project No.	Drawing No.
231030	Fig. 7-10
Scale	Date
1:30,000	17.04.2025

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7.2.6 Receptor Evaluation and Impact Assessment

7.2.6.1 Potential Impacts Associated with Proposed Lifetime Extension

Wind farms present three potential risks to birds (Drewitt and Langston 2006, 2008; *Band et al.,* 2007):

- **Direct habitat loss** due to wind farm infrastructure.
- **Disturbance/displacement** (sometimes called indirect habitat loss) if birds avoid the wind farm and its surrounding area due to construction works or turbine operation. Displacement may also include barrier effects in which birds are deterred from using normal routes to feeding or roosting grounds.
- Death through **collision** or interaction with turbine blades and other infrastructure.

For each of these three risks, the detailed knowledge of bird distribution and flight activity within and surrounding the Site has been used to predict the potential impacts of the Proposed Lifetime Extension on birds. These impacts are also assessed cumulatively with other projects. The geographical framework and description of impacts are described below.

7.2.6.2 Geographical Framework

Guidance on Ecological Impact Assessment (CIEEM, 2019) recommends categories of ornithological value that relate to a geographical framework (e.g. international through to local). This EIAR utilises the geographical framework described in 'Guidelines for Assessment of Ecological Impact of National Road Schemes' (NRA, 2009). The following geographic frame of reference should be used when determining the value of a bird population:

- International Importance
- National Importance
- County Importance
- Local Importance (Higher Value)
- Local Importance (Lower Value)

Locally Important (Lower Value) receptors are habitats and species that are widespread and of low ecological significance and important only in the local area. In contrast, Internationally Important sites are designated for conservation as part of the Natura 2000 Network (Special Area of Conservation or Special Protection Area) or provide the best examples of habitats or internationally important populations of protected flora and fauna.

7.2.6.3 Description of Impacts

The sensitivity, magnitude and significance of impacts on bird populations resulting from the Proposed Lifetime Extension was quantified according to two assessment criteria: Percival (2003) and the Environmental Protection Agency (EPA, 2022). The two assessment criteria have been used to independently characterise impacts to inform a robust assessment of potential impacts. EPA impact assessment criteria have been used for consistency between the Biodiversity and Ornithology chapters of this EIAR, while Percival (2003) has also been followed given its specific focus on birds.

Percival (2003) criteria

The Percival (2003) methodology quantifies the sensitivity of a given species to the development type, the magnitude of the effect and the significance of the potential impact. Table 7-3 (Sensitivity), Table 7-4 (Magnitude of effect) and

Table 7-5 (Determination of significance) outline the assessment criteria for each stage.

Table 7-3 Evaluation of sensitivity for birds (from Percival, 2003)

Sensitivity	Determining Factor
Very High	Species that form the cited interest of SPAs and other statutorily protected nature conservation areas. Cited means mentioned in the citation text for the site as a species for which the site is designated.
High	Species that contribute to the integrity of a SPA but which are not cited as a species for which the site is designated. Ecologically sensitive species including the following: divers, common scoter, hen harrier, golden eagle, red necked phalarope, roseate tern and chough. Species present in nationally important numbers (>1% of the Irish population)
Medium	Species listed on Annex 1 of the EU Birds Directive. Species present in regionally important numbers (>1% county population). Other species on BirdWatch Ireland's Red List of Birds of Conservation Concern
Low	Any other species of conservation interest, including species on BirdWatch Ireland's Amber List of Birds of Conservation Concern, not covered above.

Table 7-4 Determination of magnitude of effects (from Percival, 2003)

Sensitivity	Description
Very High	Total loss or very major alteration to key elements/ features of the baseline conditions, such that the post development character/composition/attributes will be fundamentally changed and may be lost from the site altogether. Guide: < 20% of population / habitat remains
High	Major loss or major alteration to key elements/features of the baseline (pre-development) conditions such that post development character/composition/attributes will be fundamentally changed. Guide: 20-80% of population/ habitat lost
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of baseline will be partially changed. Guide: 5-20% of population/ habitat lost
Low	Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline condition will be similar to pre-development circumstances/patterns. Guide: 1-5% of population/ habitat lost
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation. Guide: < 1% population/ habitat lost

Table 7-5 Significance matrix combining magnitude and sensitivity to assess significance (from Percival, 2003)

Significance		Sensitivity			
		Very High	High	Medium	Low
Magnitude	Very High	Very High	Very High	High	Medium
	High	Very High	Very High	Medium	Low
	Medium	Very High	High	Low	Very Low
	Low	Medium	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

EPA (2022) Criteria

EPA criteria use the following terms to describe the quality of the effect:

- **Positive** - a change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
- **Neutral** - no effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
- **Negative** - a change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

The significance of the effect is quantified as:

- **Imperceptible** - an effect capable of measurement but without significant consequences.
- **Not Significant** – an effect which causes noticeable changes in the character of the environment but without significant consequences.
- **Slight** - an effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- **Moderate** - an effect that alters the character of the environment that is consistent with existing and emerging baseline trends.
- **Significant** - an effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
- **Very Significant**– an effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
- **Profound** - an effect which obliterates sensitive characteristics.

The duration of effects can be:

- **Momentary** – effects lasting from seconds to minutes.
- **Brief** – effects lasting less than a day.
- **Temporary** – effects lasting less than a year.
- **Short-term** – effects lasting 1 to 7 years.
- **Medium term** – effects lasting 7 to 15 years.
- **Long term** – effects lasting 15 to 60 years.
- **Permanent** – effects lasting over 60 years.
- **Reversible** – effects that can be undone (e.g. through remediation or restoration).

The frequency of effects (i.e. how often the effect will occur) can be:

- **Once, rarely, occasionally, frequently** or **constantly**
- **Hourly, daily, weekly, monthly** or **annually**

The probability of the effect may be:

- **Likely** – the effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
- **Unlikely** – the effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

The effects may also be described in relation to their extent and context. Extent describes the population affected by an effect, while context relates the effect to the established baseline conditions.

7.2.6.4 Collision Risk Assessment

Collision-related mortality at the wind farm was estimated using the GenEst software package (version 1.4.9; Dalthorp *et al.,* 2023). The results of carcasses found during collision monitoring surveys were input into a model, along with information on the existing wind farm and survey effort, such as the 1) number of turbines, 2) the area surveyed and the 3) survey effort. This generated an estimate of mortality at the existing wind farm, which was then corrected for 4) searcher efficiency, 5) scavenger removal and 6) detection probability, based on the results of the trials.

7.2.7 Assessment Justification

7.2.7.1 Survey Data

As operational wind farms are likely to have a reduced bird interest compared with similar sites pre-development, only one year of fresh surveys is typically required as per SNH (2014). This year of surveying should include a breeding season and winter season, to account for the differences in use of the area between seasons by the local avian community. As the Taurbeg Wind Farm is located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA it was considered prudent to continue surveys beyond the usual 12-month requirement. Surveying spanned 18 months, including the winter and summer seasons.

A comprehensive suite of bird surveys was undertaken at the Site by MKO between November 2023 and September 2024, and by Ecology Ireland between April 2023 and September 2023. Results derived from a continuous year and a half of surveying at the Site and hinterland, undertaken in line with NatureScot guidance, are analysed to inform this assessment. As such, the surveys undertaken provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Lifetime Extension on avian receptors.

7.2.7.2 Mitigation and Offsetting

Where potential impacts on KORs are predicted, mitigation has been prescribed to avoid, reduce and remove such impacts. Where mitigation was not possible, offsetting was employed. Proposed best practice design and mitigation measures are specifically set out and are realistic in terms of cost and practicality. They have been subject to detailed design and will effectively address the effects on the identified KORs. As such, the potential impacts of the Proposed Lifetime Extension have been considered and assessed to ensure that all impacts on KORs are adequately addressed and no significant residual effects are likely to remain following the implementation of mitigation measures and offsetting measures (refer to Section 7.6 for further details).

7.2.7.3 Limitations

The information provided in this EIAR chapter accurately and comprehensively describes the baseline environment and provides an informed prediction of the likely impacts of the Proposed Lifetime Extension. It also prescribes mitigation/offsetting measures as necessary and describes the predicted residual effects. Furthermore, the desk study, surveys, analysis and reporting have been undertaken in accordance with the appropriate guidelines. Therefore, no significant limitations in the scope, scale or context of the assessment have been identified.

7.3 Baseline Ornithological Conditions

7.3.1 Designated Sites within the Likely ZOI of the Proposed Lifetime Extension

The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AASR and NIS that accompany this application. As per EPA Guidance (EPA, 2022), "*A biodiversity section of an EIAR ... should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment*". Therefore, this section provides a summary of the key findings regarding SPAs and nationally designated sites. For a detailed assessment of any potential impacts on SPAs, refer to the Appropriate Assessment Screening Report (AASR) and Natura Impact Statement (NIS) .

Sites designated for nature conservation within the potential ZOI of the Proposed Project were identified using GIS software. All designated sites that could potentially be affected were identified using a source-pathway - receptor model.

In addition (and in the absence of any specific European or Irish guidance), the guidance document 'Assessing Connectivity with Special Protection Areas' (SNH, 2016) was consulted. This document provides guidance on identifying of connectivity between the Site and SPAs. It considers the distances some species may travel beyond the boundary of their SPAs and outlines dispersal and foraging ranges. Potential effects on wetlands and supporting habitats associated with SPAs and potential indirect pathways in the form of surface water pollution are considered in the Appropriate Assessment and NIS and summarised below.

One SPA was identified within the likely zone of influence of the Proposed Project, Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. The SPA is summarised in Table 7-6. The next nearest SPA is situated over 26km distant from the Site - Mullaghanish to Musheramore Mountains SPA designated for breeding hen harrier. This distance is significantly beyond the foraging range of breeding hen harrier (i.e. max range of 10km – SNH (2016)).

Table 7-6 Designated sites in the Zone of Influence

Site Name	Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area				
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	The Site is situated within the SPA The Proposed Offsetting Lands are situated within the SPA	› Hen Harrier (*Circus cyaneus*) [A082]	Detailed conservation objectives for this site, (Version 1, September 2022), were reviewed as part of the assessment and are available at www.npws.ie	The Site is located within the SPA and consists of an active wind farm development. The proposed continuation of operation of the existing Taurbeg wind farm has the potential to result in likely significant effects on the qualifying interest of the SPA in the form of disturbance/displacement and mortality. **Therefore, the European Site is located within the Likely Zone of Influence.**

7.3.2 Breeding and Wintering Bird Atlas Records

"Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland' (Balmer *et al.*, 2013) is the most recent comprehensive work on wintering and breeding birds in Ireland. Previous bird atlases have been the primary source of information on the distribution and abundance of British and Irish birds prior to Bird Atlas 2007–11. The three previously published atlases were:

- The atlas of breeding birds in Britain and Ireland (Sharrock, 1976)
- The atlas of wintering birds in Britain and Ireland (Lack, 1986)
- The new atlas of breeding birds in Britain and Ireland: 1988-1991. (Gibbons *et al.,* 1993)

The Site lies within hectad R21. Table 7-7 and Table 7-8 present a list of species of conservation interest recorded from the relevant hectads, with regard to breeding and wintering respectively.

Table 7-7 Breeding Bird Atlas data. The following applies to conservation status: Annex I of the Birds Directive, Red List species on the BoCCI

Species Name	Breeding Atlas 1968-1972	Breeding Atlas 1988-1991	Breeding Atlas 2007-2011
	R21	R21	R21
Barn Owl	-	-	Possible
Corncrake	Probable	-	-
Curlew	Confirmed	Seen	-
Goshawk	-	-	Probable
Grey Wagtail	Confirmed	Breeding	Possible
Hen Harrier	Confirmed	-	Confirmed
Kestrel	Probable	Seen	Confirmed
Long-eared Owl	-	-	Confirmed
Meadow Pipit	Confirmed	Breeding	Confirmed
Merlin	-	-	Confirmed
Red Grouse	Confirmed	-	Probable
Short-eared Owl	-	-	Possible
Snipe	Confirmed	-	Probable
Sparrowhawk	Probable	-	Possible
Swift	Confirmed	Seen	Confirmed

Table 7-8 Wintering Bird Atlas data.The following applies to conservation status: Annex I of the Birds Directive, Red List species on the BoCCI.

Species Name	Wintering Atlas 1981-1984	Wintering Atlas 2007-2011
	R21	R21
Curlew	-	Present
Golden Plover	-	Present
Grey Wagtail	Present	Present

Species Name	Wintering Atlas 1981-1984	Wintering Atlas 2007-2011
	R21	R21
Hen Harrier	-	Present
Kestrel	-	Present
Kingfisher	-	Present
Lapwing	-	Present
Little Egret	-	Present
Long-eared Owl	-	Present
Meadow Pipit	Present	Present
Peregrine Falcon	-	Present
Red Grouse	Present	-
Redwing	Present	Present
Snipe	Present	Present
Sparrowhawk	-	Present
Whooper Swan	-	Present
Woodcock	-	Present

7.3.3 Bird Sensitivity Mapping Tool

A Bird Sensitivity Mapping Tool for wind energy development was developed by BirdWatch Ireland to provide a measured spatial indication of where protected birds are likely to be sensitive to wind energy developments. The tool can be accessed via the National Biodiversity Data Centre Website (www.biodiversityireland.ie) and is accompanied by a guidance document (McGuiness *et al.*, 2015). The criteria for estimating a zone of sensitivity (i.e. 'low', 'medium', 'high' and 'highest') is based on a review of the behavioural, ecological and distributional data available for each species.

The Site is located within areas of **medium** and **high** bird sensitivity to wind energy developments.

7.3.4 Irish Wetland Bird Survey Records

The Irish Wetland Bird Survey (IWeBS), coordinated by BirdWatch Ireland, monitors wintering waterbird populations at their wetland sites across Ireland. IWeBS site locations are available at https://birdwatchireland.ie/our-work/.

The Site is not covered by an I-WeBS site and the nearest site is located approximately 16km to the south–Blackwater Valley. Owing to the geographical location of the Site, close to the meeting point of three counties (Co. Cork, Co. Kerry and Co. Limerick), data from I-WeBS sites within 25km of the site has therefore been used to estimate populations at the 'county' level for wintering waterbirds identified as KORs[2]. Datasets for the following sites were sourced from www.birdwatchireland.ie and reviewed:

[2] *The limitations of using this data to estimate a county population is acknowledged, e.g. as all the counts in a given year were typically not undertaken on the same day there is the potential for under or over estimates, however, this is the best available information.*

- 0L303 Blackwater Valley ***no data available**

7.3.5 Rare and Protected Species Dataset

An information request was sent to NPWS requesting records overlapping with the Taurbeg Wind Farm from the Rare and Protected Species Database. The following records were obtained from the NPWS on the 28/12/2023. Note: the Site lies within Hectad R21 and the Proposed Offsetting Lands lie at the meeting point of the four Hectads R01, R11, R00 and R10.

Hen Harrier

Hen harrier records from National Surveys in 2015/2010/2005:

- Hectad R20: one confirmed breeding site and 9 additional sightings in 2005.
- Hectad R21: two confirmed and one possible breeding sites in 2015; one confirmed and two possible breeding sites, plus two additional sightings in 2010; six confirmed breeding sites and 22 additional sightings in 2005.

A further information request was sent on the 19/02/2025, for records overlapping with the Proposed Offsetting Lands. However no response was received.

7.3.6 Hen Harrier Programme Monitoring Data 2021

The Hen Harrier Project monitors the numbers of territorial pairs of birds in each Special Protection Area (SPA) during the breeding season. Monitoring also aims to establish the breeding outcome (i.e. success or failure of a nest and if successful, establish the number of fledged young). Nest visits are not undertaken as part of the monitoring. The most recently published report (Hen Harrier Monitoring Report 2021) was reviewed in relation to the Stack's to Mullaghareirk Mountains SPA.

During the 2021 breeding season, there were 34 confirmed pairs and two possible pairs recorded within the Stack's to Mullaghareirk Mountains SPA, as outlined in the Hen Harrier Monitoring Report 2021.

7.3.7 Hen Harrier National Survey 2022

Results from the 2022 Hen Harrier National Survey (Ruddock *et al.*, 2024) were not included in the information request outlined above. The report was therefore examined for results for the relevant hectads. Breeding statuses for each hectad is provided below:

- Site
  - Hectad R20: "Seen"
  - Hectad R21: not surveyed
- Proposed Offsetting Lands
  - Hectad R00: "Confirmed"
  - Hectad R01: "Confirmed"
  - Hectad R10: "Confirmed"
  - Hectad R11: "Confirmed"

The number of confirmed and possible hen harrier territories within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle (SPA) as provided in the report, is 21.

7.3.8 Hen Harrier Threat Response Plan 2024-2028

The Hen Harrier Threat Response Plan 2024-2028 was published by the National Parks and Wildlife Service in September 2024. As per the published document, *the aim of the Hen Harrier Threat*

Response Plan is to improve the long-term prospects for the species and to meet the objectives of the Birds Directive by:

- synthesising the key scientific evidence for the hen harrier population decline,
- *outlining the views and concerns presented by the relevant sectors,*
- *laying out a coordinated set of targeted actions and measures to cease, avoid, reverse, reduce, eliminate or prevent the identified threats, pressures and hazards.*

The Threat Response Plan details 47 actions across five areas: Cross-cutting Sectoral Actions, Agriculture, Forestry, Wind Energy and Review & Update. The broad topics included under Wind Energy are copied below:

- Informing assessment procedures with fit for purpose data construction monitoring actions.
- Improving access to data.
- Promoting effective cumulative level assessments, including collision risk modelling, at various scales.
- Efficacy of adaptive management measures, including for offsetting purposes.
- Robustness of Environmental Assessments.
- Wind Energy Development Guidelines.
- Early identification of potential problems.
- Collation of relevant planning documents.
- Promoting high quality assessments.

7.3.9 NPWS Conservation Objectives Supporting Document: Breeding Hen Harrier

The National Parks and Wildlife Service published a detailed Conservation Objectives Supporting Document for breeding hen harrier in September 2022. The Targets detailed in the document for the SPA network are copied below, as are the specific targets for the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA where relevant:

- The SPA network Target for the attribute 'population size' is to restore the numbers of confirmed breeding pairs to at least 77 – 78 confirmed breeding pairs.
    - Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA = Restore the numbers of confirmed breeding pairs to at least 38–39 confirmed breeding pairs.
- The SPA network Target for the 'productivity rate' is at least 1.0–1.4 fledged young per confirmed pair.
    - Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA = Maintain at least 1.0 – 1.4 fledged young per confirmed pair.
- The Target for 'spatial utilisation of breeding pairs' is at least 86% of the total SPA network area.
    - Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA = Restore the spatial utilisation of the SPA by breeding pairs to at least 97–98%
- For the SPA network, the Target for the attribute 'extent and condition of heath and bog' is to restore the extent and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation.
- For the SPA network, the Target for the attribute 'extent and condition of low-intensity managed grassland habitat' is to restore the extent and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation.
- The Target for the SPA network is to maintain, at least, the length and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation.
- The SPA network Target for the attribute 'age structure of the forest estate' is to achieve an even and consistent distribution of age-classes across the forest estate.
- The Target for the SPA network is that disturbance occurs at levels that do not significantly impact upon breeding hen harrier.

7.3.10 Taurbeg Wind Farm Post-Construction Hen Harrier Monitoring Reports 2006-2010

Post-construction monitoring of hen harrier activity in and around the Site was carried out by Cork Ecology during breeding seasons 2006, 2007, 2008, 2009 & 2010.

Surveys were conducted between April and August in between 2006-2010. A pre-breeding survey for territorial pairs was conducted in and around the Site in April. Vantage point surveys were carried out from four to five locations between May and August, comprising 6 hours of observation at each location in each month.

The summaries of observations and breeding activity recorded given in reports are copied below.

2006

"The 2006 study recorded a total of 7.09 minutes of Hen Harrier activity within the Wind Farm, with all observations recorded in July and August. (Table 5.3). Most activity within the Wind Farm (87.3 %) was recorded on 13th and 14th July 2006, when no turbines were operating. Hunting was the main activity recorded.

"In summary, two pairs of Hen Harrier attempted to breed within a radius of 5km of Taurbeg Wind Farm in 2006 (Sites A & C), although one pair (Site C) appeared to fail early in the season. Both Sites A and B were occupied in 2003 and 2004, although it is likely that the pair seen at Site B in April 2006 eventually settled to breed at Site C, approximately 1km away".

2007

"The 2007 study recorded a total of 18.5 minutes of Hen Harrier activity within the Wind Farm, between May and August. Most activity within the Wind Farm (87.3 %) was recorded in May and June, and involved two immature Hen Harriers that spent most of these months frequenting the slopes on the eastern side of the wind farm. Hunting was the main activity recorded."

"In 2007, no confirmed pairs of Hen Harriers were located within a 5 km radius of Taurbeg Wind Farm. Territorial behaviour was only recorded at one site within a radius of 5 km of Taurbeg Wind Farm in April 2007 (Site A). It is possible that this pair bred to the north of Site A, outside the 5 km radius in 2007".

2008

"The 2008 study recorded a total of 5.2 minutes of Hen Harrier activity within the Wind Farm, between May and August. Most activity within the Wind Farm (87.3 %) was recorded in May and July, with little activity recorded in June. Hunting was the main activity recorded."

In 2008, one confirmed pair of Hen Harriers was located within 500 m of a wind turbine, just outside Taurbeg Wind Farm (Site E). This pair appeared to fail in June, possibly as a result of very wet weather (Met Éireann 2008). Territorial behaviour was also recorded at two other sites within a radius of 5 km of Taurbeg Wind Farm in April 2008 (Sites A & D), although no further activity was recorded. It is possible that a pair bred to the north of Site A, outside the 5 km radius in 2008".

2009

Note: data available for 2009 surveys only covers June visits. The only observations during June survey comprised a male seen hunting.

2010

"The 2010 study recorded a total of 2.8 minutes of flight activity within the Wind Farm between, May and August. Hunting and circling were the main activities recorded".

"In 2010, no confirmed pairs of Hen Harriers were located within a 5 km radius of Taurbeg Wind Farm".

7.3.11 Knockacummer Wind Farm Year 5 Post-Construction Monitoring Reports (2018-2019)

The available Post-Construction Bird Monitoring Reports for Knockacummer Wind Farm were reviewed. Bird surveys were undertaken by INIS Environmental Consultants Ltd in breeding season 2018 and winter 2018/19 for Year 5 of post-construction monitoring. Notable observations with relevance to Taurbeg Wind Farm are summarised below.

Hen Harrier

There were four observations of hen harrier within 500m of the Taurbeg turbine layout during the 2018 breeding season surveys for Knockacummer Wind Farm. All observations comprised individual birds hunting and travelling, in the months of April, May and June 2018. Of the four observations, three comprised female birds and one comprised a male bird.

There were no observations of hen harrier within 500m of the Taurbeg turbine layout during the 2018/19 winter season surveys for Knockacummer Wind Farm.

Red Grouse

There was an observation of red grouse in flight within 500m of the Taurbeg turbine layout in October 2018 (approximately 100m north of T5).

7.3.12 Knockacummer & Glentane Wind Farms Year 8 Compliance Report (2022)

Vantage point surveys were carried out by Woodrow APEM Group at Knockacummer Wind Farm (six VP locations) and Glentane Wind Farm (five VP locations) between March and September 2022, comprising a total of 36 hours of observation per vantage point location. Notable observations with relevance to Taurbeg Wind Farm are summarised below.

Hen Harrier

There were 14 observations of hen harrier within 500m of the Taurbeg turbine layout during the 2022 breeding season during surveys for Knockacummer Wind Farm. A male hen harrier was observed displaying within 500m of the Taurbeg turbine layout (between T7 & T9) in late March 2022. The remaining observations all comprised individual birds hunting and travelling, in the months of May, July and August 2022. Of the 12 observations, 10 comprised male birds, one female and one ringtail (juvenile).

A male was observed sky-dancing in late April 2022 approximately 850m north of the Taurbeg turbine layout (T6).

7.3.13 Field Survey Results

The target species recorded within the potential ZOI of the Site during field surveys are listed in Table 7-9, along with a summary of breeding and roosting status. The following sections describe the records of each target species under the individual survey headings.

Table 7-9 Target species recorded in the Potential ZOI of the Proposed Lifetime Extension

Species	Overall breeding status	Overall wintering status
Golden Plover (Annex I)	Non-breeding. No observations during breeding season.	There was no evidence of roosting during surveys.
Hen Harrier (Annex I)	Non-breeding. There was no evidence of breeding at the Site during surveys.	No observations during winter season.
Nightjar (Annex I)	**Possible Breeding**. A bird was observed churring in suitable habitat approximately 550m from the Site boundary, with a second subsequent observation of a bird flying in this same general area, indicating probable breeding.	No observations during winter season.
Osprey (Annex I)	Non-breeding. There was no evidence of breeding at the Site during surveys.	No observations during winter season.
Short-eared Owl (Annex I)	**Probable Breeding.** A bird was observed hunting within the Site boundary and travelling with prey away from the Site, indicating probable breeding[3].	There was no evidence of roosting at the site during surveys.
Curlew (Red Listed)	Non-breeding. No observations during breeding season.	Single flyover observation recorded.
Kestrel (Red Listed)	**Probable Breeding**. Bird seen in display flight in April 2023 approximately 100m from Site boundary.	There was no evidence of roosting at the site during surveys.
Red Grouse (Red Listed)	**Probable Breeding**. Males recorded responding to tape-lure during dedicated survey in February 2024, indicating probable breeding within Site.	Resident during winter season. No regularly used roosts identified.

[3] *In accordance with Hardey* et al. *(2018) criteria for evidence of occupancy for short-eared owl, "*owl(s) carrying prey*" is taken as "*probable territory/breeding*".*

Species		Overall breeding status	Overall wintering status
Snipe (Red Listed)		Non-breeding. There was no evidence of breeding at the Site during surveys. Only observations during breeding season were from early April.	No regularly used roosts identified.
Woodcock (Red Listed)		Non-breeding. No observations during breeding season.	There was no evidence of roosting at the site during surveys.
Buzzard (Raptor)		Non-breeding. There was no evidence of breeding at the Site during surveys.	No regularly used roosts identified.
Sparrowhawk (Raptor)		Non-breeding. There was no evidence of breeding at the Site during surveys.	No regularly used roosts identified.
Passerines (Red Listed)	**Grey Wagtail**	Non-breeding. All observations were greater than 1km from the Site	All observations were greater than 1km from the Site
	Meadow Pipit	**Confirmed breeding.** Breeding widespread within Site and surrounding areas.	Present within Site during winter season.
	Redwing	Non-breeding. No observations during breeding season.	Present within Site during winter season.

A list of all bird species recorded during surveys is provided in Appendix 7-1. Appendix 7-3 presents results summary tables including:

- Summary of vantage point survey records
- Summary of breeding walkover survey records
- Summary of breeding raptor survey records
- Summary of breeding woodcock survey records
- Summary of breeding red grouse survey records
- Summary of winter walkover survey records
- Summary of hen harrier roost survey records
- Summary of non-target species recorded

7.3.13.1 Golden Plover

Golden plover were observed in the winter and passage seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023[4]

There were 17 observations of golden plover during breeding season 2023 vantage point surveys. All observations were from two days in late September 2023. Observations comprised between 2-25 birds

[4] *Vantage Point Surveys in April – September 2023 were undertaken by Ecology Ireland.*

travelling and circling and all were within or partially within a 500m radius of turbines. There were two observations of birds landing, beyond 500m from the turbine layout and both comprising two birds.

Vantage Point Surveys 2023-2024

Golden plover was infrequently recorded, the species was observed once every 36 hours of vantage point surveys. There were eight observations of golden plover during vantage point surveys, in the months of November, January and March. All observations comprised birds travelling, with flock size ranging from an individual up to 200 birds. Of the eight observations, seven were within or partially within 500m of the turbine layout (1-200 birds), and one was approximately 1km distant from the turbine layout comprising 100 birds potentially landing.

7.3.13.2 Hen Harrier

Hen harrier were observed in the breeding season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023

There were 33 observations of hen harrier during breeding season 2023 vantage point surveys, within the months of April, June, July and September. All observations comprised individual birds, the majority of which comprised birds hunting and travelling. Of the 33 observations, 26 were within / partially within 500m of the turbine layout.

There was an observation of a ringtail sky-dancing in late April 2023 approximately 700m west of closest turbine (T3), before then commuting away from Site. A male was observed travelling with prey on 18th July 2023 in the same general area, approximately 650m from the closest turbine (T3) and travelling west away from Site. There was a second observation of a male carrying prey on 25th July 2023, seen within the Site and travelling south-west away from the Site.

Vantage Point Surveys 2023-2024

There were three observations of hen harrier during vantage point surveys. Hen harrier was infrequently recorded, the species was observed once every 96 hours of vantage point surveys. All observations were of individual birds. There were two observations from the same day in April 2024, both of a male bird travelling. The first observation was within the Site. The second of these two observations was at approximately 15-minutes post-sunset and comprised the bird possibly going to roost, although the sighting was obscured by trees, at a location approximately 1.3km from the closest turbine. The third observation comprised a ringtail travelling partially within 500m of the turbine layout in August 2024.

Breeding Walkover Surveys 2024

There were four observations of hen harrier during breeding walkover surveys. Hen harrier was infrequently recorded, the species was observed once every 9 hours of breeding walkover surveys. All observations comprised single birds with no breeding behaviour recorded. The first observation comprised a bird hunting outside the Site in early April 2024, approximately 150m west of T5. The second and third observations both comprised a male bird seen a few minutes apart on the same day in late May 2024, travelling within the Site and were assumed to be the same bird. The final observation comprised a female travelling approximately 750m east of the Site in late July 2024.

Breeding Raptor Surveys 2024

There were two observations of hen harrier during breeding raptor surveys, both comprising individual males seen travelling in May 2024, with no breeding behaviour recorded. The first observation was partially within the Site, and the second observation was within the Site.

Proposed Offsetting Lands

Breeding raptor surveys are on-going at the Proposed Offsetting Lands during breeding season 2025. Initial results from these surveys in April to June 2025 have recorded a total five observations of hen harrier, two during survey in April 2025 and three during survey in May 2025. All five observations comprised a male bird, observed hunting and travelling within the Proposed Offsetting Lands and surrounding area.

7.3.13.3 Nightjar

Nightjar was observed in the breeding season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to breeding locations are provided in Confidential Appendix 7-5.

Incidental Records

There were two incidental observations of nightjar recorded during breeding woodcock and vantage point surveys. Both observations were in May 2024 and were from consecutive days. The first observation comprised a bird heard churring at dusk in an area of young forestry approximately 550m from the Site (approximately 750m from nearest turbine – T10), indicating possible breeding in this area. The second observation comprised a bird seen travelling at dawn in the same general area, approximately 300m from the Site.

Breeding Nightjar Surveys 2024

No nightjar were recorded during the dedicated breeding nightjar surveys.

7.3.13.4 Osprey

Osprey was observed in the breeding season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023

There were two observations of osprey, both within a minute of each other, in June 2023. The bird was observed travelling approximately 600m from the Site at the closest point.

7.3.13.5 Short-eared Owl

Short-eared owl was observed in the winter and breeding seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023-2024

There were two observations of short-eared owl during vantage point surveys. Both observations comprised individual birds. The first observation, in late February 2024 comprised a bird travelling approximately 150m south of the Site (c.240m from nearest turbine at closest point). The second

observation, in early July 2024, comprised a bird hunting within the Site (30m from the nearest turbine at the closest point) and then subsequently travelling with prey away from the Site.

While the observation of a bird carrying prey does not necessarily confirm breeding (as birds can travel with prey to locate a favoured perch or feeding area and not exclusively to a nest site), adopting a precautionary approach, probable breeding is considered within the wider area of the Site.

7.3.13.6 Curlew

Curlew was observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023-2024

There was a single observation of curlew during vantage point surveys, comprising a bird heard calling travelling overhead approximately 1.3km west of the Site in November 2023.

7.3.13.7 Kestrel

Kestrel was observed in the winter and breeding seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023

There were 143 observations of kestrel during breeding season 2023 vantage point surveys. The majority of observations comprised single birds hunting and travelling. There were two observations of breeding behaviour. There was an observation of a bird displaying in late April 2023 approximately 100m from the Site and travelling away from Site indicating probable breeding in this general area (Ref: K-a, see Confidential Appendix for breeding locations). In mid-July 2023 there was an observation of a kestrel mobbing buzzards approximately 300m from the Site. As by mid-July most young will likely be fledged and therefore capable of flight, this observation does not indicate breeding took place at this specific location. Of the 143 observations, 125 were within, or partially within the 500m turbine radius.

Vantage Point Surveys 2023-2024

Kestrel was infrequently recorded, the species was observed once every 10 hours of vantage point survey. There were 27 observations of kestrel during vantage point surveys. The majority of observations comprised individual birds hunting and travelling. There was a single observation of two birds together in August 2024. There was no breeding activity recorded. Of the 27 observations. 16 were within, or partially within the 500m turbine radius.

Breeding Raptor Surveys 2024

There were eleven observations of kestrel during breeding raptor surveys. All observations comprised individual birds hunting or travelling. No breeding activity was recorded. Of the 11 observations, four were within, or partially within the 500m turbine radius.

Incidental Records 2023-2024

There was one incidental record of kestrel during a breeding walkover survey, comprising an individual bird hunting within the Site in July 2024, seen before beginning of survey.

7.3.13.8 Red Grouse

Red grouse was observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to breeding locations are provided in Confidential Appendix 7-5.

Vantage Point Surveys 2023

There were three observations of red grouse during breeding season 2023 vantage point surveys. One observation was within the Site and comprised two birds landing in heather in April 2023. The two remaining observations were from an area approximately 400m from the Site and comprised single birds flying up from bog, in April and August 2023.

Vantage Point Surveys 2023-2024

There were ten observations of red grouse during vantage point surveys, within April, May, September and November. The majority of observations comprised birds heard calling. There were two observations of two birds together calling and flying in November 2023 and April 2024. There was one observation of three birds together calling and flying in September 2024. Of the ten observations, two were within the Site and the remaining observations were within a 500m radius of the Site.

Breeding Red Grouse Survey 2024

There were four observations of red grouse recorded during the dedicated red grouse tape lure survey. Two of the observations comprised single birds flushed by the surveyor with no calling recorded. There were two observations of birds heard calling, one of which was after the tape lure had been played indicating probable breeding at these locations (Ref: RG-a & RG-b – see Confidential Appendix 7-5).

Winter Walkover Surveys 2023-2024

There was one observation of red grouse during winter walkover surveys, comprising droppings recorded on road within Site in December 2023.

Incidental Records 2023-2024

There were three incidental records of red grouse recorded during other surveys. Two observations were within same area birds were recorded in during the dedicated red grouse surveys and vantage point surveys.

Breeding Summary

Red grouse activity, including calls, were recorded in three areas during the late 2023/24 winter season and the 2024 breeding season, indicating probable breeding in these areas. One breeding location was within the Site (*c.*50m from nearest turbine [Ref: RG-a]), and two in areas directly adjacent to the Site (c.50m from nearest turbine [Ref: RG-b] & c.150m from nearest turbine [Ref: RG-c] – see Confidential Appendix 7-5).

7.3.13.9 Snipe

Snipe were observed in the winter and passage seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to breeding locations are provided in Confidential Appendix 7-5.

Vantage Point Surveys 2023-2024

There was one observation of snipe during vantage point surveys, comprising two birds travelling outside of the Site (*c.*250m from nearest turbine at closest point) in December 2023.

Breeding Walkover Surveys 2024

There were five observations of snipe during breeding walkover surveys. All observations were in early April and comprised between 1-2 birds being flushed and travelling. All observations were within the Site / 500m turbine radius and no breeding activity was recorded.

Winter Walkover Surveys 2023-2024

There were three observations of snipe during winter walkover surveys, within month of January and February. All observations were within the Site / 500m turbine radius and comprised individual birds flushed from ground.

Incidental Records 2023-2024

There were four incidental records of snipe during other surveys. Observations comprised between 1-2 birds flushing, two within the Site and two outside of the Site (three within 500m turbine radius and one outside 500m turbine radius).

7.3.13.10 Woodcock

Woodcock was observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023-2024

There was one observation of woodcock during vantage point surveys, comprising a single bird travelling in March 2024 approximately 200m from the Site.

Breeding Woodcock Surveys 2024

There were no observations of woodcock during the dedicated breeding woodcock surveys.

Incidental Records 2023-2024

There were two incidental records of woodcock during vantage point surveys, both comprising individual birds flushed from ground; one within Site in February 2024 and other approximately 2km from the site in March 2024.

7.3.13.11 Buzzard

Buzzard was observed in the winter and breeding seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023

There were 54 observations of buzzard during breeding season 2023 vantage point surveys. The majority of observations comprised single birds hunting and travelling. No breeding activity was recorded. Of the 54 observations, 41 were within, or partially within, a 500m radius of turbines.

Vantage Point Surveys 2023-2024

There were 20 observations of buzzard during vantage point surveys. The majority of observations comprised single birds hunting and travelling. There were some observations of two birds in flight together during 2024 breeding season however no breeding activity was recorded. Of the 20 observations, 9 occurred within / partially within the Site, and 13 were within / partially within a 500m radius of turbines.

Breeding Walkover Surveys 2024

There was one observation of buzzard during breeding walkover surveys, comprising an individual bird hunting approximately 300m from the Site (450m from nearest turbine at closest point) in June 2024.

Breeding Raptor Surveys 2024

There were twelve observations of buzzard during breeding raptor surveys. The majority of observations comprised single birds hunting and travelling. There was no observation of breeding activity. Of the 12 observations, four were within / partially within a 500m radius of turbines.

Incidental Records

There was one incidental record of buzzard, comprising three birds soaring together over area approximately 2.5km from the Site in April 2024.

7.3.13.12 Sparrowhawk

Sparrowhawk was observed in the winter and breeding seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys 2023

There were eight observations of sparrowhawk during breeding season 2023 vantage point surveys. Observations comprised between 1-2 birds hunting and travelling. Of the eight observations, six were within / partially within 500m radius of turbines (two were partially within the Site).

Vantage Point Surveys 2023-2024

There were two observations of sparrowhawk during vantage point surveys. Both observations comprised individual birds travelling. One observation was partially within the Site in November 2023, and one was beyond 500m from turbines (approximately 300m from Site boundary) in April 2024.

Incidental Records

There was one incidental record of sparrowhawk from hen harrier roost survey, comprising an individual bird travelling partially within the Site in January 2024 (approximately 50m form nearest turbine).

7.3.13.13 Passerines (Red-Listed)

Grey Wagtail

There were five observations of grey wagtail across all surveys. Observations comprised between 1-2 birds travelling and calling. All observations were greater than 1km from the Site.

Meadow Pipit

Meadow pipit were regularly recorded within the Site during surveys, with observations recorded in all months. There were a total of 68 observations of meadow pipit from all surveys, with flock sizes recorded ranging from an individual up to 13 birds. Birds were recorded displaying, calling and carrying nest material during breeding walkover surveys within the Site, indicating widespread breeding within the Site in areas of suitable habitat.

Redwing

There were two observations of redwing across all surveys. The observations comprised flocks of 3-8 birds travelling and landing. One observation was partially within the Site and the other observation was approximately 1km from the Site.

7.4 Receptor Evaluation

7.4.1 Determination of Population Importance

A determination of population importance for birds within the likely ZOI is provided below, following criteria described in Section 7.2.6. Estimates of national population sizes were obtained from the most recent species-specific national survey, or national surveys by Burke *et al.* (2018), Lewis *et al.* (2019a), Crowe *et al.* (2014) and Lewis *et al.* (2019b), or Ireland's Article 12 Reporting 2013-2018 (EU, 2022), depending on what literature was available. Estimates for mean county population sizes were obtained from species-specific surveys, a review of I-WeBS sites within a 25km radius of the Site[5], or derived from national estimates, according to what literature was available.

Following NRA (2009), a population of National Importance is a regularly occurring population that exceeds 1% of the national population. Similarly, a population of County Importance is a regularly occurring population that exceeds 1% of the county population. Locally Important (Higher Value) populations are resident or regularly occurring species of conservation concern of importance at the local level, while Locally Important (Lower Value) populations are resident or regularly occurring species of some local importance.

7.4.1.1 Golden Plover

The estimated national wintering population of golden plover in Ireland is 80,707 for the Republic of Ireland (ROI) (Burke et al. 2018). 1% of the ROI National wintering population of golden plover is 807 birds. As per NRA 2009, a regularly occurring population of 807 golden plover is required for classification as Nationally Important.

The maximum number of birds recorded within 500m of the turbine layout from the winter season surveyed was 200 birds. A regularly occurring Nationally Important population was not therefore observed. There is no data relating to golden plover from any I-WeBS sites within 25km of the Site and therefore no available estimate of county population.

There were no observations of golden plover utilising habitats within the Site or 500m turbine radius during all surveys, with all observations within the 500m turbine radius comprising birds travelling or circling. However, adopting a precautionary approach, and acknowledging the lack of available county population data for golden plover, the population recorded is classed as of **County Importance** on the basis of a resident/regularly occurring wintering population assessed to be important on a county level.

7.4.1.2 Hen Harrier

Wintering

There were no observations of hen harrier during the winter season across all surveys. Similarly, there are no records of hen harrier within 500m of the turbine layout during the core winter month from all available data as investigated during desk study. The Site is of **No Ecological Importance** to this species during the winter season.

[5] *Please note that these figures are estimates based on the best available information but should be interpreted with a degree of caution.*

Breeding

Based on the latest Breeding Hen Harrier Survey (Ruddock et al., 2024), the Republic of Ireland national breeding population is in the range of 85 – 106 pairs. Therefore, a single breeding pair in Ireland conforms to National Importance as per NRA criteria.

There has been no confirmed breeding of hen harrier within 500m of the turbine layout from all available data (i.e. desk study results & field surveys). However, hen harrier have been recorded breeding within 5km of the Site, with up to two pairs recorded across the monitoring years (2006-2010). In 2008 a pair was recorded within 500m of the turbine layout. During surveys in breeding season 2023, skydancing was recorded approximately 700m from the turbine layout and a male was seen carrying prey on two separate occasions away from the Site in this general direction.

While activity has varied between years, hen harrier have been recorded hunting and travelling within 500m of the turbine layout during all breeding seasons for which there is available data. Therefore, while no breeding has been confirmed within 500m of the turbine layout, the Site and 500m turbine radius is providing a utilised foraging resource for hen harrier likely associated with nest sites in the surrounding area during the breeding season. The population recorded during surveys is classified as of **National Importance.**

7.4.1.3 Nightjar

Nightjar is a rare breeding bird in Ireland. There is no national population estimate for breeding nightjar, however available information would indicate there are only a handful of potential breeding locations throughout the country. Though at one point widespread records in more recent times have been largely restricted to the south-east of Ireland (as per BirdWatch Ireland 2024 survey commentary[6]).

A bird was observed churring in suitable habitat approximately 550m from the Site (700m from the nearest turbine), with a second subsequent observation of a bird flying in this same general area. Given how rare a breeding bird this is in Ireland, it is considered possible that the calling male is indicative of a breeding pair but more than likely not. Though breeding is not ruled out completely, it is most likely that it was a lone male prospecting for a mate. This may explain why the records from surveys in May 2024 were restricted to two consecutive days before the male (presumably) moved on to continue his search for a female. There were no further observations, despite dedicated survey visits in June 2024. Notwithstanding this, these nightjar records are worthy of further consideration.

Given the rarity of this species, the recorded nightjar is assigned **National Importance** on the basis that possible breeding was recorded within 500m of the Site.

7.4.1.4 Osprey

There was a single observation of osprey, comprising a bird travelling over 500m distant from the Site in June 2023, which likely comprised a non-breeding bird on passage. The Site is therefore of **No Ecological Importance** to this species, given there were no observations within the Site and only a single observation of a bird travelling.

7.4.1.5 Short-eared Owl

Short-eared owl is a rare breeding species in Ireland. There is no population estimate for breeding short-eared owl, however a review of the most recent Bird Atlas (2007 – 2011) shows a limited distribution largely limited to a few locations in the south-west and north-east of the country. The Site

[6] *https://www.youtube.com/watch?v=R00gkg5Qx_4&t=302s*

Synopsis documents for the Stack's To Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA confirm the species has been known to breed within the SPA.

A bird was observed hunting within the Site and subsequently travelling with prey away from the Site in July 2024, indicating probable breeding within the wider area of the Site. Therefore, given the rarity of this species, the recorded short-eared are classified as of **National Importance** on the basis that probable breeding was likely within the wider surrounding area of the Site, and the species was confirmed to utilise the Site as a foraging resource in the breeding season.

7.4.1.6 Curlew

There was a single observation of curlew, comprising a bird travelling over 1.3km distant from the Site in November 2023. The Site is therefore of **No Ecological Importance** to this species, given there were no observations within the Site and only a single observation of a bird travelling.

7.4.1.7 Kestrel

As reported (2013-2018) under Article 12 of the Birds Directive (Directive 2009/147/EC), the national breeding population estimate of kestrel in the ROI is 13,500 birds. Using these latest figures, 1% of the National population of kestrel is 135 birds. Therefore, as per NRA 2009, a regularly occurring population of 135 birds is required for classification as Nationally Important.

There are no published figures for the County Cork population of kestrel. The Bird Atlas (2007 – 2011) provides breeding and wintering distribution maps for birds in Ireland. Using these maps, and using the national population estimate for kestrel of 13,500 birds, county populations can be inferred by examining distribution points for each county. The population of kestrel in Co. Cok is therefore roughly estimated to be 1,485 birds. Therefore, a regularly occurring population of 14 birds is required for classification of County Importance.

There were no kestrel nest sites identified within the Site. There were two observations of breeding activity (display and mobbing) within 500m of the Site during breeding season 2023. Adopting a precautionary approach, this is assumed to be two breeding pairs within 500m of the Site. This indicates a resident population of four adult birds during the breeding season in the wider area. Kestrel were regularly recorded hunting within the Site, and it can therefore be assumed birds from these territories utilise the Site as hunting grounds. This population would be bolstered by fledglings at the end of the breeding season, which will remain present in the area until the start of the next breeding season, when birds become territorial again. Given that kestrel have brood sizes of four to five chicks, and a survival rate of 30% in their first year[7], it is likely that there would be a population of approximately four adults and three juvenile birds by the end of each winter season. The population recorded at the Site was therefore assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.4.1.8 Red Grouse

As per the results of the National Red Grouse Survey 2006-2008, the estimated national population of red grouse in Ireland is 1,898 pairs (or 4,218 birds). As per NRA 2009, a population of 18 pairs is required for classification as Nationally Important.

There are no published figures for county populations of red grouse. The National Red Grouse Survey 2006-2008 report outlines estimates for broad regions of the country. The population estimate for the "Southwest" region is 132 birds. Taking a precautionary approach, a single red grouse pair is therefore required for classification of County Importance.

[7] https://app.bto.org/birdfacts/results/bob3040.html

Red grouse activity was recorded in three areas within the Site and immediate vicinity during breeding season surveys, indicating a minimum of three potential breeding pairs. The population within the Site is therefore assigned **County Importance** for red grouse on the basis of a resident/regularly occurring population assessed to be important on a county level.

7.4.1.9 Snipe

Wintering

There are no population estimates for wintering snipe in Ireland. As reported (2013-2018) under Article 12 of the Birds Directive (Directive 2009/147/EC), the national breeding population estimate of snipe in the Republic of Ireland is 4,275 breeding pairs. However, the wintering snipe population in Ireland is significantly bolstered by migration of European birds. The estimated breeding population in Britain is 67,000 pairs, in comparison to a wintering population estimate of 1.1 million birds[8]. Using this as a general reference, and adopting a precautionary approach, a five-fold increase in population in Ireland is estimated for wintering snipe – giving a wintering population estimate of 42,750 birds. Therefore, as per NRA 2009, a regularly occurring population of 427 birds is required for classification as Nationally Important.

There are no published figures for the County Cork populations of snipe. The Bird Atlas (2007 – 2011) provides breeding and wintering distribution maps for birds in Ireland. Using these maps, and using the estimated wintering population for snipe of 42,750 birds (outlined above), county populations can be inferred by examining distribution points for each county. A highly conservative estimate of the wintering population of snipe in Co. Cork is therefore 7,690 birds. Therefore, a regularly occurring population of 79 birds is required for the classification of County Important.

Snipe were flushed within the Site during winter walkover surveys in January and February 2024, and during breeding walkover surveys in early April 2024. The timing and locations of these observations were analysed, giving an estimate minimum count of five birds occurring within the Site. The population recorded at the Site was therefore assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

Breeding

The only observations of snipe during the breeding season within 500m of the Site are from early April, and likely represent birds on passage and are therefore taken to be part of the wintering population. There were no observations of snipe during the months of May – July and no observations of drumming or breeding behaviour. The Site is of **No Ecological Importance** to this species during the breeding season, given that there were no observations of this species within the Site during the main breeding season months.

7.4.1.10 Woodcock

Wintering

There were only two observations of woodcock within 500m radius of turbines during the winter season from all surveys, both comprising an individual birds. The Site is of **No Ecological Importance** to this species during the winter season, given that there was only one observation of this species within the Site over the 1.5 years of surveying.

[8] https://www.bto.org/understanding-birds/birdfacts/snipe

Breeding

There were no observations of woodcock during the breeding season, including during dedicated dusk breeding woodcock surveys. The Site is of **No Ecological Importance** to this species during the breeding season, given that there were no observations of this species within the Site during the breeding season.

7.4.1.11 Buzzard

Buzzard is not listed on Annex I of the Birds Directive. The species is Green listed in Ireland (BoCCI). The population recorded across the seasons was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.4.1.12 Sparrowhawk

Sparrowhawk is not listed on Annex I of the Birds Directive. The species is Green listed in Ireland (BoCCI). The population recorded was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.4.1.13 Passerines (Red-Listed)

Grey wagtail, meadow pipit and redwing are Red listed on the BoCCI. Populations recorded at the Site were deemed to be of no greater than **Local Importance (Lower Value)**.

7.4.2 Identification of Key Ornithological Receptors

Table 7-10 outlines the rationale for including or excluding each target species recorded during field surveys as a KOR. The conservation status, population importance evaluation following NRA (2009) and a detailed explanation for inclusion/exclusion as a KOR is provided. The sensitivity of species included as KORs are then evaluated in the following section.

Table 7-10 Receptor evaluation and selection criteria rational

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Golden Plover	Annex I Birds Directive & BoCCI Red List	**Wintering** Country Importance	Golden plover were observed travelling and circling over the Site during the winter season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**
Hen Harrier	Annex I Birds Directive & SCI of Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	**Wintering** No population of ecological significance recorded	There were no observations of hen harrier during the winter season during field surveys and from desk study results. As such, the potential for disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Lifetime Extension will have a significant effect on this species.	**No**
		Breeding National Importance	Hen harrier was observed travelling and hunting within the Site during the breeding season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**
Nightjar	Annex I Birds Directive & BoCCI Red List	**Breeding** National Importance	Possible breeding for nightjar was recorded approximately 500m from the Site during the 2024 breeding season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Osprey	Annex I Birds Directive	**All seasons** No population of ecological significance recorded	No population of ecological significance was recorded utilising the Site or 500m radius of turbines during the extensive suite of surveys conducted. As such, the potential for disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Lifetime Extension will have a significant effect on this species.	**No**
Short-eared Owl	Annex I Birds Directive	**Breeding** National Importance	Short-eared owl was observed hunting within the Site during the breeding season, and likely related to a breeding pair in the wider area. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**
Curlew	BoCCI Red List	**Wintering** No population of ecological significance recorded	No population of ecological significance was recorded utilising the Site or 500m radius of turbines during the extensive suite of surveys conducted. As such, the potential for disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Lifetime Extension will have a significant effect on this species.	**No**
Kestrel	BoCCI Red List	**All seasons** Local Importance (Higher Value)	Kestrel were observed travelling and hunting within the Site during the breeding season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**
Red Grouse	BoCCI Red List	**All seasons** County Importance	Red grouse activity was recorded in three areas within the Site and immediate vicinity during breeding season surveys, indicating a minimum of three potential breeding pairs. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Snipe	BoCCI Red List	**Wintering** Local Importance (Higher Value)	Snipe were recorded within the Site during the winter season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**
		Breeding No population of ecological significance recorded	There were no observations of snipe during the months of May – July and no observations of drumming or breeding behaviour. As such, the potential for disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Lifetime Extension will have a significant effect on this species.	**No**
Woodcock	BoCCI Red List	**Wintering** No population of ecological significance recorded	No population of ecological significance was recorded utilising the Site or 500m radius of turbines during the extensive suite of surveys conducted. As such, the potential for disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Lifetime Extension will have a significant effect on this species.	**No**
		Breeding No population of ecological significance recorded	There were no observations of woodcock during the breeding season, including dedicated dusk breeding woodcock surveys. As such, the potential for disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Lifetime Extension will have a significant effect on this species.	**No**
Buzzard	BoCCI Green List; a species sensitive to Wind Farm Developments	**All Seasons** Local Importance (Higher Value)	Buzzard were observed travelling and hunting within the Site during the breeding season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Sparrowhawk	BoCCI Green List; a species sensitive to Wind Farm Developments	**All Seasons** Local Importance (Higher Value)	Sparrowhawk were observed travelling and hunting within the Site during the breeding season. The potential for displacement and collision risk cannot be excluded. As such, an assessment for displacement and collision risk is required for this species.	**Yes**
Passerines (Red Listed)	BoCCI Red List & Irish Wildlife Act.	**All Seasons** Local Importance (Lower Value)	As per NatureScot guidance, it is considered that passerine bird species are not significantly impacted by wind farms due to their ecology and large populations. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the development will significantly impact these species.	**No**

7.4.2.1 Summary

The following have been selected as KORs:

- Hen Harrier (breeding)
  - **Note**: the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is included and assessed as part of the assessment for hen harrier in the following sections of this report.
- Nightjar (breeding)
- Short-eared Owl (breeding)
- Golden Plover (wintering)
- Kestrel (all seasons)
- Red Grouse (all seasons)
- Snipe (wintering)
- Buzzard (all seasons)
- Sparrowhawk (all seasons)

7.4.3 Key Ornithological Receptor Sensitivity Determination

Criteria developed by Percival (2003) for assessing bird sensitivity within the Site is presented in Table 7-3 (Section 7.2.6). The sensitivity of the KORs, as per Percival (2003), are listed below, including the rationale for their respective sensitivity classification.

Very High Sensitivity KORs are:

- Hen Harrier (breeding, SCI of Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA)

High Sensitivity KORs are:

- Nightjar (breeding; Annex I; national importance)
- Short-eared Owl (breeding; Annex I; national importance)

Medium Sensitivity KORs are:

- Golden Plover (wintering; Annex I)
- Kestrel (all seasons; Red List)
- Red Grouse (all seasons; Red List)
- Snipe (wintering; Red List)

Low Sensitivity KORs are:

- Buzzard (all seasons; lower conservation concern)
- Sparrowhawk (all seasons; lower conservation concern)

7.5 Potential Impacts

All elements of the Proposed Lifetime Extension have been considered in assessing impacts on KORs. This section is structured as follows:

- Assessment of 'Do nothing' Effect
- Assessment of impacts in relation to KORs during construction and operation
- Assessment of impacts in relation to KORs during decommissioning
- Assessment of impacts associated with the grid connection route
- Assessment of impacts on designated areas

7.5.1 Do-Nothing Effect

If the Proposed Lifetime Extension were not to proceed, the existing Taurbeg Wind Farm turbines would be decommissioned in 2026, in accordance with the conditions of the current planning permission. Upon decommissioning of the existing Taurbeg Wind Farm, the 11 no. turbines would be removed from site. It is considered the more environmentally prudent approach to leave all roads and hardstands in situ. The presence of the turbines is likely to be resulting in a displacement effect that is reducing the occurrence of birds onsite (Pearce-Higgins *et al.*, 2009). In the absence of turbines, it is assumed that the character of the bird community, including the KORs identified, will remain much as is described in the baseline ornithological conditions with the potential for an increase in occurrence for all species, including hen harrier.

If the Proposed Lifetime Extension were not to proceed, the opportunity to continue generating renewable energy and electrical supply to the national grid would be lost, as would the opportunity to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

7.5.2 Collision Risk Assessment

As is noted in SNH (2014) and in contrast to a greenfield site, flight activity surveys should not be used to inform a collision risk model at an operational wind farm as the turbines are in situ. Carcass searches instead should inform that assessment.

Collision-related mortality at the wind farm was estimated using the GenEst software package (version 1.4.9; Dalthorp et al., 2023). The results of carcasses found during collision monitoring surveys were input into a model, along with information on the existing wind farm and survey effort, such as the 1) number of turbines, 2) the area surveyed and the 3) survey effort. This generated an estimate of mortality at the existing wind farm, which was then corrected for 4) searcher efficiency, 5) scavenger removal and 6) detection probability, based on the results of the trials.

The model estimates with 90% confidence that between 11 and 41 bird fatalities occurred over the study period at the wind farm (estimated mortality = 22 birds [confidence intervals 10.87-40.56]. This scales to 1.83 [confidence intervals 0.91-3.38] birds per turbine per year. It can be assumed (all else being equal) that the birds that are most likely to suffer collisions are those that are most abundant at the Site. The recorded carcasses included two pheasants, one corvid and four passerines. Please see Appendix 7-6 for further details.

This is a very low rate of predicted collisions, no significant collision risk effects are therefore predicted for any species at Taurbeg Wind Farm.

7.5.3 Effects on Key Ornithological Receptors during Operation and Decommissioning

The boxes in the following sections describe potential effects on KORs that may occur during the extended operation and decommission of the wind farm. The magnitude and significance of these effects are then defined according to Percival (2003) and EPA (2022) criteria.

7.5.3.1 Golden Plover (Wintering)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	Golden plover were infrequently recorded at the Site during the winter season. All observations comprised birds travelling, with flock sizes ranging from an individual up to 200 birds. There were no observations of birds utilising habitats within the Site or 500m turbine radius. There were 24 total observations of birds in flight within or partially within 500m of the turbine layout over the 1.5 years of surveying, 17 of which were from two days in September 2023. The majority of the habitat within the site is heath with tall vegetation, which is of limited ecological value to golden plover. In addition, significant avoidance of the existing turbines was not evident during surveys, as much of the observed golden plover activity during vantage point surveys was close to the turbines: 51% were 0-100m from turbines. Therefore, it is likely that golden plover will continue to utilise the area within 500m of the turbines, in the way they currently are, and significant impacts of displacement and barrier effects are not anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Medium* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	Furthermore, significant areas of suitable foraging habitat for the species occur in the wider landscape and will be retained. The onsite heath and commercial forestry habitat is not of high value to golden plover and are not unique to the Site. In the event of displacement, there are extensive areas of more suitable foraging and roosting habitat in the wider area. This would likely render such an effect inconsequential. No significant effect of displacement or barrier effect are anticipated.		
Collision Risk	This species was recorded flying within the Site, including 12 observations at PCH. However, collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is very low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Medium* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Medium* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely long-term constant not significant neutral effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Disturbance	There is potential for displacement of wintering golden plover within the Site during decommissioning works. However, all observations of golden plover over the 1.5 years of surveying comprised birds in flight, with no observations of birds utilising habitats within the Site or within 500m radius of the turbine layout. The potential for any disturbance events during decommissioning works is therefore limited. Furthermore, the decommissioning works are proposed to be completed within a six-month timeframe. Given the abundance of more favourable suitable habitat in the surrounding area (i.e. improved grassland) and that this is a widespread species that forages in an abundant habitat in Ireland (e.g. improved grassland), no significant displacement is anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Medium* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely temporary frequent not significant negative effect**

7.5.3.2 Hen Harrier (Breeding)

Context: The hen harrier population in Ireland is in decline[9]. In Ireland hen harrier prefer to hunt within pre-thicket forestry (Wilson *et al.* 2006; Wilson *et al.* 2010; Irwin *et al.* 2012), heath/bog (Wilson *et al.* 2010) and rough/marginal or low-intensity agricultural grassland habitats (Wilson *et al.* 2006; Irwin *et al.* 2012). The factors implicated in the decline include human-related habitat modification and loss. Such habitat modification includes afforestation, agricultural intensification (High Importance) and the proliferation of turbines (Medium Importance) in the upland regions inhabited by breeding hen harrier, as outlined in Article 12 Reporting 2013-2018 (EU, 2022) and reiterated in the Hen Harrier Threat Response[10]. The Site is located within the Stack's to Mullaghereirk Mountains, West Limerick Hills and Mount Eagle SPA, where the population is declining. The national threats/pressures of afforestation, agricultural intensification and the proliferation of turbines are also evident in these uplands, with afforestation in particular noted during the 2022 national survey as "a substantial factor affecting the distribution and abundance of hen harrier in this region."

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	The continued operation of the existing wind farm has the potential to displace hen harrier from the Site, in the absence of offsetting measures there is the potential for an ongoing significant (indirect) habitat loss effect due to avoidance of turbines. This assessment is based on the following rationale, firstly the Site overlaps with the local occurrence of hen harrier (see Sections 7.3.6 – 7.3.8) and secondly, the Site includes optimal foraging habitat (in the absence of turbines). There has been no confirmed breeding of hen harrier within 500m of the turbine layout from all available data. However, there were numerous observations of hen harrier hunting and travelling at the Site during the 2023 and 2024 breeding season surveys, and from desk study results for previous	The magnitude of the effect is assessed as *Medium*. The cross tablature of a *Very High* sensitivity species and *Medium* effect corresponds to a ***High*** effect significance.	**Likely medium-term constant significant negative effect**

[9] *Ruddock, M., Wilson-Parr, R., Lusby, J., Connolly, F., J. Bailey, & O'Toole, L. (2024). The 2022 National Survey of breeding Hen Harrier in Ireland. Report prepared by Irish Raptor Study Group (IRSG), BirdWatch Ireland (BWI), Golden Eagle Trust (GET) for National Parks & Wildlife Service (NPWS). Irish Wildlife Manuals, No. 147. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.*

[10] *It is noted that this document does not rank the importance of these threats/pressures, although they are listed in the same order as here.*

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	years where there is available data. Breeding has been recorded within 5km of the Site in previous years, with up to two pairs recorded across the monitoring years (2006-2010). In 2008 a male and female was recorded within 500m of the turbine layout, and there have been a small number of observations of breeding behaviour within 500m of the turbine layout across all available data in following years, although no confirmed breeding. It is assumed that hen harrier recorded hunting within the Site are associated with breeding pairs within the wider area. The majority of the habitat within the site is heath, scrub with some small sections of hedgerows and agricultural grassland, which is an optimal foraging habitat for hen harrier. There is also some commercial forestry habitat which is of more limited value. Furthermore, key prey species such as meadow pipit were abundant onsite. The presence of the Taurbeg Wind Farm turbines is likely reducing the frequency of foraging (onsite). Research has identified a reduction of 52.5% activity within 500m of operating wind turbines and significant avoidance within 250m (Pearce-Higgins *et al.*, 2009). To assess whether or not the displacement of hen harrier from the site is likely to result in a significant effect we must consider whether this displacement effect would result in the loss of a scarce resource. The proliferation of forestry, primarily, but also intensive agriculture and turbines in the SPA, has meant that heath/scrub habitat is far less abundant than it would otherwise be. This relative scarcity of the scrub/heath habitat is likely a key factor limiting range recovery (i.e. spatial utilisation) and the associated population size and productivity (as per Article 12 Reporting). While significant avoidance of the existing turbines was not evident during surveys, adopting a precautionary approach, it is considered that the existing wind farm has the potential to result in a displacement effect for hen harrier from an area of suitable habitat. This indirect habitat loss due to avoidance was calculated to be **122.43ha**. This calculation was undertaken as follows.		

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	Foraging hen harrier have the potential to be displaced from suitable foraging habitat to a distance of 250m from turbines (Pearce-Higgins *et al.*, 2009)[11]. Please see Appendix 7-7 for a detailed discussion of the calculation rationale. To calculate the amount of foraging habitat that would be lost through avoidance, on a precautionary basis, it was assumed that there would be one hundred percent avoidance to within 250m of turbines by foraging hen harrier. The sum of the predicted loss of suitable[12] foraging habitat due to avoidance (for all eleven turbines) is predicted to total **122.43ha.** Given the relative scarcity of scrub/heath habitat within the SPA, the loss due to avoidance of **122.43ha** is likely to give rise to significant effects for foraging hen harrier without intervention. <u>In summary</u> No significant effects are predicted at hen harrier nesting or roosting sites, given the absence of local nest or roost sites. Significant displacement effects on foraging hen harrier are predicted without intervention. Accordingly, a comprehensive offsetting strategy (Proposed Offsetting Plan) is proposed, please see Section 7.7 and Appendix 7-7 for details.		

[11] Pearce-Higgins et al., (2009) noted significant avoidance of turbines to 250m. Figure 1 shows that the reductions in hen harrier density mainly occur within 250m of a turbine. The statistical model from this paper assumes a linear relationship between bird density and distance from a turbine in 500m distance bands. This means that if the avoidance effect extends for less than 500m the model is likely to overpredict the displacement effect at 500m. There is therefore a sound scientific basis for using a 250m buffer rather than 500m for estimating the hen harrier displacement effect.

[12] Suitable habitat was defined as all open habitats likely to contain passerines (e.g., wet grassland and peatland) and forestry in its pre-thicket phase. Under normal forestry management, forestry is available for foraging hen harrier approximately 20% of the lifetime.

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	This species was recorded flying within the Site, including six observations at PCH. However, collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. This prediction is corroborated by the literature. The Windharrier research project[13] carried out by University College Cork (UCC) between 2012 and 2014, found the risk of collisions for hen harrier to be low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Very High* sensitivity species and *Negligible* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**
Decommissioning Phase			
Direct (physical) Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Very High* sensitivity species and *Negligible* effect corresponds to a ***Low*** effect significance.	**Likely long-term constant not significant neutral effect**
Disturbance	There is potential for displacement of hen harrier during decommissioning works. In relation to disturbance from human activity, a buffer of 300-750m is recommended for breeding hen harrier (Goodship & Furness, 2022). This	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Very High*	**Likely temporary frequent slight negative effect**

[13] *Wilson* et al. *(2015). The interactions between Hen Harriers and wind turbines. WINDHARRIER Final Project Report. School of Biological, Earth & Environmental Sciences, University College Cork, Ireland.*

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	buffer relates to disturbance around nest sites. There was no breeding recorded within 750m of the Site, and any of the proposed decommissioning works areas, during the two breeding seasons surveyed (2023 & 2024). It is noted that the decommissioning works are proposed to be completed within a six-month timeframe and any potential effects will therefore be temporary. Furthermore, on-going bird monitoring is proposed as part of the Proposed Lifetime Extension (see Section 7.9.2). The results of these surveys will inform the timing of decommission works and therefore limits potential for any disturbance effects. No significant effects are predicted.	sensitivity species and *Negligible* effect corresponds to a ***Low*** effect significance.	

7.5.3.3 Nightjar (Breeding)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	There were no observations of nightjar within the Site or within a 500m radius of turbines. A churring male, indicating possible breeding for nightjar, was recorded approximately 700m from the nearest turbine, with a second subsequent observation of a bird travelling in this same general area. This suitable habitat extends from the Site boundary out to 1km from the Site and comprises young pre-thicket commercial forestry. Nightjar are a rare breeding species in Ireland, however recorded breeding has almost exclusively been in recently felled and young pre-thicket forestry habitats. This is similar to UK where 80% of breeding occurs in forestry plantations (Conway *et al.*, 2007).	The magnitude of the effect is assessed as *Low*. The cross tablature of a *High* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	There is very limited published research on displacement effects on nightjar from wind energy developments. Recent monitoring for nightjar at Pen y Cymoedd wind farm in Wales found no evidence of displacement of territorial birds (five nests were located, the closest of which was within 60m of the base of a turbine). The habitats within the Site largely comprise heath, scrub and mature forestry, which are not typical nesting habitat for nightjar in Ireland. However, open areas of heath may be utilised as a foraging resource. The areas of suitable nesting habitat (i.e. recently felled forestry and young pre-thicket plantations) are situated outside of the Site. The area of possible breeding recorded during surveys in 2024 is over 500m from Site and 700m from nearest turbine. As such, the potential for displacement effects are limited. No significant effect of displacement or barrier effect are anticipated.		
Collision Risk	There were no observations of this species at PCH and collision-related mortality incidents for this species were not detected during 12 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *High* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *High* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely long-term constant not significant neutral effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.		
Disturbance	There is potential for displacement of breeding nightjar during decommissioning works. In relation to disturbance from human activity, a buffer of 150-500m is recommended for breeding nightjar (Goodship & Furness, 2022). The possible breeding recorded during breeding season 2024 was situated over 500m from the Site and 700m from the nearest turbine, and therefore beyond the maximum recommended disturbance buffer. However, suitable contiguous habitat extends to the boundary of the Site (and *c.*130m from nearest turbine). Taking a highly precautionary approach, there is therefore a potential for breeding nightjar to be disturbed during decommissioning works should these works take place during the breeding period for nightjar (i.e. late May to August) and should nightjar occur within this buffer zone.	The magnitude of the effect is assessed as *Medium*. The cross tablature of a *High* sensitivity species and *Medium* effect corresponds to a ***High*** effect significance.	**Likely temporary frequent significant negative effect** **Please note that mitigation is proposed to avoid potential impacts.**

7.5.3.4 Short-eared Owl (Breeding)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	There were two observations of short-eared owl from all surveys – February 2024 and July 2024. A bird was observed hunting within the Site and subsequently travelling with prey away from the Site in July 2024, indicating probable breeding within the wider area of the Site. There were no further observations during the 2024 breeding season and no observations during the 2023 breeding season from all surveys. The probable breeding recorded during breeding season 2024 was situated outside of the Site. The bird seen carrying prey was travelling away from the Site and was last seen, still flying away from the Site, approximately 300m from the nearest turbine. There is very limited published research on displacement effects on short-eared owl from wind energy developments. A recent study from Amherst Island in the US on the impact of wind turbines on the distribution of wintering short-eared owl noted that short-eared owl abundance did not change after turbine construction (Mitchell, 2024). Therefore, it is likely that short-eared owl will continue to utilise the Site and significant impacts of displacement and barrier effects are not anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *High* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**
Collision Risk	There were no observations of this species at PCH and collision-related mortality incidents for this species were not detected during 12 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *High* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *High* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely long-term constant not significant neutral effect**
Disturbance	There is potential for displacement of short-eared owl during decommissioning works. In relation to disturbance from human activity, a buffer of 300-500m is recommended for breeding short-eared owl (Goodship & Furness, 2022). The probable breeding recorded during breeding season 2024 was situated outside of the Site. The bird seen carrying prey was travelling away from the Site and was last seen approximately 300m from the nearest turbine continuing away form the Site. The potential nest site was therefore likely beyond the recommended disturbance buffer zone. In addition, there were only two observations of short-eared owl during the 1.5 years of surveying (one in breeding season and one in winter season). The Site is therefore not utilised regularly by this species for foraging and the potential for disturbance events during decommissioning works is therefore limited. Given the presence of similar suitable hunting habitat in the surrounding area and the limited usage of the Site by this species, no significant disturbance effects are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *High* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely temporary frequent slight negative effect**

7.5.3.5 Kestrel (All Seasons)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	Kestrel were regularly recorded hunting at the Site during surveys. There were 146 total observations within, or partially within, a 500m radius of the turbine layout over the 1.5 years of surveying (125 of which were during 2023 breeding season). A kestrel was seen in display flight in April 2023 approximately 100m from Site, indicating probable breeding in this area for the 2023 breeding season. Significant avoidance of the existing turbines was not evident within the study area, as much of the observed kestrel activity during vantage point surveys was close to the turbines.: Of the total number of flight observations, over half occurred within 50m of turbines: 55% within 50m of the turbines, 69% within 100m of turbines, 73% within 200m of turbines and 76% within 500m of turbines (the remaining 24% were 500m+ from turbines). This observation is further corroborated in the literature: kestrels have been found to only show low levels of turbine avoidance and are known to continue foraging activity close to turbines (Pearce-Higgins *et al.*, 2009). Therefore, it is likely that kestrel will continue to utilise the Site and significant impacts of displacement and barrier effects are not anticipated at the county, national or international level. No significant effect of displacement or barrier effect are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**
Collision Risk	This species was recorded flying within the Site, including 74 observations at PCH. However, collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low*	**Likely medium-term constant slight negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	effect corresponds to a ***Low*** effect significance.	
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely long-term constant not significant neutral effect**
Disturbance	Kestrel were regularly recorded within the Site and surrounds throughout the breeding and winter seasons. Birds were hunting in the Site, but no breeding behaviour was observed within the Site. There is potential for displacement of hunting kestrel within the Site during decommissioning works. However, given the abundance of similar suitable hunting habitat in the surrounding area and that this is a widespread species and not a habitat specialist, no significant displacement are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely temporary frequent slight negative effect**

7.5.3.6 Red Grouse (All Seasons)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	Red grouse were recorded within the Site during the breeding and winter seasons, indicating the species is resident locally. Red grouse activity was recorded in three areas within the Site and it's immediate vicinity during breeding season surveys, including dedicated tape-lure surveys, indicating a minimum of three potential breeding pairs. Significant avoidance of the existing turbines was not evident during surveys. Up to three breeding territories were identified within the Site and immediate surrounds, two of which were within 50m of the nearest turbine. This observation is further corroborated in the literature: a review of monitoring data from wind farms in upland habitats in the UK showed that while red grouse densities at wind farm sites reduced during construction, densities recovered by the first year after construction, indicating minimal displacement effects (Pearce-Higgins *et al.*, 2012). Therefore, it is likely that red grouse will continue to utilise the Site and significant impacts of displacement and barrier effects are not anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**
Collision Risk	There were no observations of this species at PCH and collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Medium* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**
Decommissioning Phase			

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tablature of a *Medium* sensitivity species and *Negligible* effect corresponds to a ***Very Low*** effect significance.	**Likely long-term constant not significant neutral effect**
Disturbance	There is potential for displacement of breeding red grouse during decommissioning works. A review of monitoring data from wind farms in upland habitats in the UK showed that red grouse densities reduced at wind farm sites during construction works (Pearce-Higgins *et al.*, 2012). It should be noted that decommissioning works are considered to be far less intrusive than construction works. A buffer zone of 100m has previously been recommended where construction works should be excluded while red grouse are breeding (Biosphere Environmental Services Ltd., 2020). Red grouse territories were recorded within 100m of turbines, and there is therefore a potential for breeding red grouse to be disturbed during decommissioning works should these works take place during the breeding period for red grouse (i.e. April to July) and should red grouse occur within this 100m buffer zone.	The magnitude of the effect is assessed as *High*. The cross tablature of a *Medium* sensitivity species and *High* effect corresponds to a ***Medium*** effect significance.	**Likely temporary frequent moderate negative effect** **Please note that mitigation is proposed to avoid potential impacts.**

7.5.3.7 Snipe (Wintering)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	There were 12 total observations of birds within, or partially within, 500m of the turbine layout over the 1.5 years of surveying, with most observations comprising single birds flushed from the ground. Significant avoidance of the existing turbines was not evident during surveys, as much of the observed snipe activity was close to the turbines – of the 12 total observations, ten were within 200m of turbines. Studies in relation to snipe and displacement effects from wind farms mostly relate to breeding snipe – e.g. Pearce-Higgins *et al.* (2009) found that breeding snipe showed significant avoidance of turbines extending to a distance of 400m, with breeding density reduced by up to 50% within this area (Pearce-Higgins *et al.*, 2009). Breeding activity was not recorded for snipe within the Site or within 500m turbine radius. Wintering non-breeding birds are assumed to be at less risk of displacement effects, as they are not tied to a fixed location (i.e. nest site) and are therefore less restricted in their selection of habitats. The habitats within the Site and 500m turbine radius comprise heath and commercial forestry which are not unique to the Site or rare locally. Therefore, it is likely that wintering snipe will continue to utilise the Site and significant impacts of displacement and barrier effects are not anticipated at the county, national or international level. No significant effect of displacement or barrier effect are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	This species was recorded flying within the Site, with one observation at PCH recorded over the 1.5 years of surveying. Collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely medium-term constant slight negative effect**
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely long-term constant not significant neutral effect**
Disturbance	Snipe were recorded within the Site during the winter season. There is potential for displacement of snipe within the Site during decommissioning works. However, given the abundance of similar suitable habitat in the surrounding area and that this is a widespread species and numbers recorded within the Site were minor (i.e. estimate of five birds during walkover surveys), no significant displacement are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Medium* sensitivity species and *Low* effect corresponds to a ***Low*** effect significance.	**Likely temporary frequent slight negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)

7.5.3.8 Buzzard (All Seasons)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	Buzzard were regularly recorded hunting at the Site during surveys. There were 59 total observations within, or partially within, a 500m radius of the turbine layout over the 1.5 years of surveying. There were no observations of breeding behaviour. Significant avoidance of the existing turbines was not evident during surveys, as much of the observed buzzard activity during vantage point surveys was close to the turbines. Of the total number of flight observations, over half occurred within 50m of turbines: 53% within 50m of the turbines, 59% within 100m of turbines, 68% within 200m of turbines and 73% within 500m of turbines (the remaining 27% were 500m+ from turbines)Therefore, it is likely that buzzard will continue to utilise the Site and significant impacts of displacement and barrier effects are not anticipated at the county, national or international level. No significant effect of displacement or barrier effect are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	This species was recorded flying within the Site, including 41 observations at PCH. However, collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely long-term constant not significant neutral effect**
Disturbance	Buzzard were regularly recorded within the Site and surrounds throughout the breeding and winter seasons. Birds were hunting in the Site, but no breeding behaviour was observed within the Site or surrounding area. There is potential for displacement of hunting buzzard within the Site during decommissioning works. However, given the abundance of similar suitable hunting habitat in the surrounding area and that this is a widespread species and not a habitat	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely temporary frequent not significant negative effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	specialist, no significant displacement are anticipated at the county, national or international level.		

7.5.3.9 Sparrowhawk (All Seasons)

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated as there is no new infrastructure proposed.	**No Effect**	**No Effect**
Displacement and Barrier Effect	Sparrowhawk were infrequently recorded hunting and travelling at the Site during surveys. There were only eight total observations within, or partially within, a 500m radius of the turbine layout over the 1.5 years of surveying. There were no observations of breeding behaviour. Significant avoidance of the existing turbines was not evident within the Site. There were several observations of sparrowhawk flying close to turbines. Therefore, it is likely that sparrowhawk will continue to utilise the Site and significant impacts of displacement and barrier effects are not anticipated at the county, national or international level. No significant effect of displacement or barrier effect are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**
Collision Risk	This species was recorded flying within the Site, including seven observations at PCH. However, collision-related mortality incidents for this species were not detected during 17 months of dog-led searches at all turbine bases. Based on available data (including GenEst results), collision-related mortality is not likely to significantly impact this species and the predicted collision risk is low. No significant effects are anticipated.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely medium-term constant not significant negative effect**
Decommissioning Phase			
Direct Habitat Loss	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected and all above-	The magnitude of the effect is assessed as *Low*. The cross	**Likely long-term constant not significant positive effect**

Potential effects during the operational and decommissioning phases of the Proposed Lifetime Extension		Significance (Percival, 2003)	Significance (EPA, 2022)
	ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and commercial forestry uses. The only areas involved in the decommissioning works are existing areas of hardstanding and artificial surfaces. There will be no loss habitat as part of the decommissioning works and therefore no potential for habitat loss effects. No significant effects are anticipated.	tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	
Disturbance	Sparrowhawk were recorded within the Site and surrounds during the breeding and winter seasons. Birds were hunting in the Site, but no breeding behaviour was observed within the Site or surrounding area. There is potential for displacement of hunting sparrowhawk within the Site during decommissioning works. However, given the abundance of similar suitable hunting habitat in the surrounding area and that this is a widespread species and not a habitat specialist, no significant displacement are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tablature of a *Low* sensitivity species and *Low* effect corresponds to a ***Very Low*** effect significance.	**Likely temporary frequent not significant negative effect**

7.5.4 Effects on Designated Areas

As per the EPA Guidance (2022), *"A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive"*. This section provides a summary of the key assessment findings with regard to potential impacts on European sites.

The Stage 1 Screening Assessment concluded as follows:

'Following an examination, analysis and evaluation of the relevant data and information set out within this Appropriate Assessment Screening Report, it is concluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Lifetime Extension, individually or in combination with other plans and projects, is likely to have significant effects on the following sites::

- *Lower River Shannon SAC [002165]*
- *Blackwater River (Cork/Waterford) SAC [002170]*
- *Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA [004161]*

As a result, an Appropriate Assessment is required, and a Natura Impact Statement has been prepared.'

The NIS concluded as follows:

'This NIS has provided an assessment of all potential adverse effects on European Sites. The potential for adverse effects was identified for the following European Sites: Lower River Shannon SAC, Blackwater River (Cork/Waterford) SAC, and Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. No potential for adverse effect was identified for any other European Site.

Where the potential for any adverse effect on the Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. Therefore, it can be objectively concluded that the Proposed Lifetime Extension, individually or in combination with other plans or projects, will not adversely affect the integrity of the Lower River Shannon SAC or Blackwater River (Cork/Waterford) SAC.

The potential for adverse effect on Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA cannot be robustly blocked by avoidance, appropriate design, or mitigation measures.

Therefore, it is concluded that the Proposed Lifetime Extension will adversely affect the integrity of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, in view of the site's conservation objectives.

It is recommended that the Article 6(4) (of Council Directive 92/43/EEC (The EU Habitats Directive)) process be engaged. Volume 2 includes the Assessment of Alternative Solutions and Imperative Reasons of Overriding Public Interest,"

As outlined in Section 7.4.2.1, the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA has been included and assessed in this Chapter as part of the assessment for hen harrier, provided in Section 7.5.3.2.

7.6 Mitigation and Best Practice Measures

This section describes the measures that are in place to mitigate the negative effects associated with the Proposed Lifetime Extension on avian receptors. Effects on avian receptors may be addressed in two ways: (i) design of the Proposed Lifetime Extension and (ii) management of the development phases.

Because this planning application relates to the extension of life to an existing wind farm, there will be no design stage. However, it may be noted that the original project design ensured that hard standing areas were designed to the minimum size necessary to accommodate the turbines.

The development phases of a project are (i) the construction phase, (ii) the operation of the wind farm and (iii) decommissioning of the wind farm. Because this planning application relates to the extension of life to an existing wind farm, there will be no construction phase. Mitigation relating to the remaining phases are discussed below.

7.6.1 Construction Phase

As has been detailed in Chapter 1 and Chapter 4 of this EIAR, no construction works or ground works are required as part of the Proposed Lifetime Extension, as the proposal seeks to extend the operational life of the existing wind farm. Therefore, there will be no loss or disturbance of habitats associated with any of the aforementioned KOR species, there are no mitigation measures proposed, and the impact will be not significant.

7.6.2 Operational Phase

An operational phase impact was identified for breeding hen harrier (***High***, as per Percival (2003) criteria; ***Significant***, as per EPA (2022) criteria – see Section 7.5.2 above). Specific offsetting measures are therefore required, the implementation of these measures is described in Section 7.7 below.

No significant operational phase impacts requiring mitigation were identified for any other species. The review of effects on these KORs considered habitat loss, displacement and barrier effects and collision risk during the operational phase. No effect significance greater than ***Low,*** as per Percival (2003) criteria, was identified for any other KOR. No effect significance greater than ***Slight,*** as per EPA (2022) criteria, was identified for any other KOR.

7.6.3 Decommissioning Phase

7.6.3.1 General Measures

The potential impacts associated with future decommissioning of the existing Taurbeg Wind Farm in *c.*10 years will be similar to those associated with a typical wind farm construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works, as outlined in Chapter 4 of this EIAR. During decommissioning, it may be possible to reverse or at least reduce some of the potential impacts caused during the initial construction of the wind farm by rehabilitating construction areas such as turbine bases and hard standing areas. This will be done by covering with local topsoil and reseeding with a local native mix to encourage vegetation growth and reduce run-off and sedimentation.

Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above-ground turbine components will be separated and removed off-site for reuse or recycling.

It is proposed to leave turbine foundations in place underground and to cover them with earth and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration. It is also proposed to leave access roads in-situ, as these are in use by the participating landowners to access their lands and as existing walking trails, and to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works.

Mitigation measures, as outlined below, will be implemented during the future decommissioning phase to avoid any potential effects. A decommissioning plan will be agreed upon with the local authorities at least three months prior to decommissioning of the existing Taurbeg wind Farm. This decommissioning plan will include industry best practise measures to mitigate the impact of works on birds, which may include the following:

- All machinery will work from the existing access road corridor.
- Any required vegetation removal will be conducted in line with the provisions of the Wildlife Acts 1976-2021.
- Decommissioning works will begin outside the bird nesting season as defined by the Wildlife Act 1976 as amended (1st of March to the 31st of August). Any requirement for works to run into the subsequent breeding season will be subject to pre-works bird surveys to confirm the absence of breeding birds of conservation concern. If such breeding activity is identified during the works, the nest sites will be located, and no works shall be undertaken within an agreed buffer in line with industry best practise.
- Noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use.
- Silt fences will be installed as an additional water protection measure around existing watercourses.
- An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include:
    - Organise the undertaking of a pre-works walkover bird survey to ensure that significant effects on birds will be avoided.
    - Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site.
    - Oversee management of ornithological issues during the works period and advise on ornithological issues as they arise.
    - Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.
    - Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to decommissioning progress.

7.6.3.2 Measures Pertaining to Breeding Nightjar and Red Grouse

Probable red grouse breeding territories were identified within the Site and immediate surrounds in 2024. A possible nightjar territory was identified approximately 500m from the Site in 2024. As outlined in Section 7.5.3, there is the potential for short-term moderate to significant negative effect (EPA, 2022) on these species as a result of the potential for disturbance during decommissioning works, in the absence of mitigation. Specific mitigation measures are therefore required, the implementation of these measures is described below.

Red Grouse

- Any decommissioning works envisioned to take place during the period April – July will be preceded by a pre-commencement survey to investigate the presence of breeding red grouse.

The survey will follow the methodology outlined in Section 7.2.4.2.7 (i.e. a tape-lure survey during period December - March to identify territorial males);
- Should territorial males be recorded during survey, then these works will be restricted to outside the main breeding season for red grouse, i.e. April - July.

Nightjar

- Any works within 500m of the identified area of contiguous breeding habitat (see Figure 7.5.1.2 in Confidential Appendix 7-5) during the period May to August will be preceded by a pre-commencement survey to investigate whether any potential breeding nightjar are present within 500m of the proposed works. The survey will follow the methodology outlined in Section 7.2.4.2.6 (i.e. dusk surveys during period late May to July to identify churring males);
- Should churring males be recorded during the survey, then the works within 500m of the suitable breeding habitat will be restricted to outside the main breeding season for nightjar, i.e. May - August.

7.7 Proposed Offsetting Plan

7.7.1 Overview

The Proposed Lifetime Extension has the potential for the ongoing displacement of hen harrier from the Site, in the absence of offsetting measures there is the potential for an ongoing *likely medium-term constant significant negative* (indirect) habitat loss effect, as detailed in Section 7.5.3.2. Accordingly, a comprehensive offsetting strategy is proposed, please see below for details. The Proposed Offsetting lands are located in Knockatee and Coom, Co. Kerry, approximately 11.5km east from the Taurbeg Wind Farm site and are situated entirely within the SPA.

The EU Biodiversity Strategy's objective is to put EU's biodiversity on the path to recovery by 2030 and that by 2050, all of the EU's ecosystems will be restored, resilient and adequately protected. It is noted that among other things, climate change is a key underlying driver of biodiversity loss. While the Proposed Lifetime Extension has the potential to negatively impact hen harrier, renewable energy plays a key role in counteracting climate change. It is this dichotomy that necessitates the consideration of reasonable alternatives that limit biodiversity loss while facilitating the retention of renewable energy developments such as the existing Taurbeg Wind Farm. To that end, the offsetting plan that accompanies this application aims to ensure that the retention of the existing Taurbeg turbines is not at the expense of suitable hen harrier habitats. This opportunity for the wind farm industry to fund the restoration of hen harrier habitat was highlighted in the most recent National Survey of Breeding Hen Harrier (2022) report. Section 4.6.7 states:

> *"There are opportunities for the wind energy industry to increase levels of land management certainty, and regulation/management of the activities within and surrounding windfarms (e.g. recreational users, dog walkers etc) and identify opportunities for the retention and restoration of habitats suitable for breeding (and wintering) hen harrier within and surrounding renewable energy developments."*

The Hen Harrier Threat Response Plan (HHTRP) (2024-2028) identifies a need for innovation and collaboration to achieve the goals of the plan. Section 7 of the HHTRP sets out the actions that need to be taken to realise the objectives of the plan between 2024 and 2028. Collaboration with non-governmental stakeholders is identified as a key to the delivery of the plan.

The following offsetting plan is based on the best available scientific knowledge.

A key premise of the Proposed Offsetting Measures is that forestry is a net negative for hen harrier. Forestry is generally accepted to be a habitat that is a net negative for hen harrier, as it is only available

to hen harrier for a short period while young (i.e. pre thicket). The majority of commercial forestry's lifecycle is spent as close canopy forestry, a habitat type of little to no ecological value to hen harrier. At a national level, as highlighted in Article 12 reporting, afforestation is a threat/pressure of high importance for hen harrier. Similarly, as per the Natura 2000 Data Form which lists site-specific threats and pressures for the SPA, '*sylviculture, forestry*' is allocated the highest rank. The forestry to be permanently felled as part of Proposed Offsetting Measures is at thicket stage and is therefore not useful to hen harrier. A key element of the Proposed Offsetting Measures is permanent deforestation to create optimal foraging habitat in its place for the benefit of hen harrier. While hen harrier do nest in forestry, deforestation as part of the Proposed Offsetting Measures will not significantly reduce the availability of nesting habitat within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This SPA is heavily afforested. Thus, removing forestry to create hen harrier foraging habitat is a net positive.

It is noted that this Proposed Offsetting Plan includes for permanent deforestation to offset in large part for a 10-year Proposed Lifetime Extension. In the event of a successful grant of permission, after the 10-year period the wind farm would be decommissioned but the Proposed Offsetting Lands will continue to be managed for the benefit of hen harrier. This offers considerable benefits to hen harrier in the long term.

The land chosen for offsetting fulfils the requirement to maintain the overall coherence of the Natura 2000 network. The two key elements that have been addressed are the proportionality and ecological functionality of the Proposed Offsetting Lands. The justification for the choice of the offsetting lands includes the following:

- To address the requirement for proportionality, Proposed Offsetting Lands have been proposed at a (slightly greater than) 1:1 ratio. In addition, the approximate 105.5ha of deforested lands will be restored to optimal hen harrier habitat and **permanently** managed as such.
- Offsetting is proposed within the SPA for which the hen harrier is the qualifying interest as this is preferable where ecological coherence and network functionality exist as per C(2021) 6913 part2/2[14] Section 3.3.3. These criteria are fulfilled as follows:
    - There is suitable habitat that runs in a contiguous block between the site of impact (Taurbeg Wind Farm) and the Proposed Offsetting Lands. This same area likely hosts a single population with an exchange of individuals.
    - A plan is in place to create optimal hen harrier foraging habitat within the Proposed Offsetting Lands.
    - The Proposed Offsetting Lands are proposed for the benefit of the SPA hen harrier population and ensure no loss of foraging habitat within the SPA due to the Proposed Lifetime Extension.
- Like-for-like habitat will be created within the SPA (i.e. foraging habitat will replace the foraging habitat indirectly lost through avoidance),
- The conservation objectives of the SPA that relate to forestry concern the maintenance of a diverse age class, therefore the Proposed Offsetting Measures are not already foreseen in the SPA's specific conservation objectives and are thus additional.
- The deforestation in particular will increase the amount of contiguous open habitat and link two areas of optimal (heath/bog) foraging habitat to the north and south.
- The plan ensures the removal of closed-canopy forestry, that would not otherwise have been felled until maturity (and subsequently replanted) without intervention. Thus increasing '*spatial utilisation*' locally. Noting afforestation as a threat/pressure of high importance (as per Article 12 reporting).
- The removal of forestry will reduce negative edge effects through deforestation, e.g. predation.
- There is a high likelihood of the Proposed Offsetting Lands being encountered by hen harrier as breeding hen harrier occur locally. As extrapolated from the results of the most recent

[14] *Commission notice: Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC*

National Hen Harrier Survey (Ruddock *et al.*, 2024), hen harrier were confirmed to have bred in all four 10km grid squares which overlap with the Proposed Offsetting Lands in 2022 (i.e. R00, R01, R10 & R11) in 2022. Previous to this, hen harrier were confirmed to have bred in the 10km grid squares R10 and R11 as per the Bird Atlas 2007-11. There is therefore longstanding breeding activity locally.

To demonstrate the degree to which the management measures of the Proposed Offsetting Plan will improve the area for hen harrier, Appendix 7-7 provides an outline of the current habitat quality versus the value of the proposed created habitat over time. The Proposed Offsetting Plan aims to create habitats of higher quality than would be made unavailable through the continued operation of the Taurbeg Wind Farm.

The currently afforested areas within the Proposed Offsetting Lands (Areas 1, 2 & 4) include pockets of native vegetation (e.g. *Molinia* grass, ling heather and grey willow) around the perimeter and within fire breaks. There is also a large area of *Molinia* grass and ling heather upslope of the Proposed Offsetting Lands (i.e. Mount Eagle summit). This vegetation will act as the (passive) donor seed bank. In addition, tree/scrub species, will be planted in approximate 0.2ha blocks to create patchy scrub (proposed tree species and further detail provided in Appendix 7-7). Passerine prey is already abundantly present in the adjacent heath to the north and south of the offsetting lands. There is therefore no foreseen barrier to entry for passerines to populate the Proposed Offsetting Lands once created.

The c. 17.7ha of open habitat (wet grassland with evidence of past improvement) included in the Proposed Offsetting Plan (Area 3) is currently of limited ecological value to hen harrier. The inclusion of a passerine seed crop, a rotational grazing regime and reinstatement of hedgerows etc will ensure that optimal hen harrier habitat is created and will increase levels of land management certainty. This is discussed in greater detail in Appendix 7-7.

The above summary justification for the choice of the Proposed Offsetting Lands and the rationale behind the proposed management measures are discussed in further detail in Appendix 7-7. In addition, the Proposed Offsetting Plan outlines how the management measures will be implemented, audited and a timeline is provided.

Following the successful implementation of the Proposed Offsetting Plan, no net loss of the available hen harrier habitat is predicted due to the continuing operation of the existing Taurbeg Wind Farm. The Proposed Offsettinng Plan has been created following the best available scientific knowledge. Notwithstanding this, a comprehensive monitoring plan is proposed which includes recommendations for adaptive management if required. Please see Appendix 7-7 and Appendix 7-8 for details. The results of the monitoring of the proposed measures would be reported to the local authority and made publicly available. Adaptive management would be developed in consultation with NPWS and employed where measures do not prove to be efficient.

Following the permanent deforestation of approximately 105.5ha of forestry and the restoration of a further 17.7ha of agricultural land for the benefit of hen harrier, residual impacts of no greater than negligible are predicted as a result of the Proposed Lifetime Extension.

7.7.2 Proposed Offsetting Measures Impact Assessment

This section specifically addresses the potential for measures within the Proposed Offsetting Lands to result in significant effects. In short, no significant effects are predicted. This is based on the following rationale.

A full description of the Proposed Offsetting Measures are provided in Appendix 7-7. In summary, it is proposed to create optimal hen harrier foraging habitat of 105.5ha of forestry and 17.7ha of farmland. The management prescriptions include the deforestation of forestry and restoration of its underlying habitat and similarly the restoration of the farmland.

Commercial forestry is a habitat type of generally low ecological value. This monoculture crop is typically also low in biodiversity. There is an abundance of commercial forestry within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. Relative to this abundance, a small area of forestry will be permanently felled as part of this offsetting plan. This deforestation will therefore not result in the loss of a scarce resource for the local avian community, including hen harrier.

Forestry is generally accepted to be a habitat that is a net negative for hen harrier, as it is only available to hen harrier for a short period while young (i.e. pre thicket). The majority of commercial forestry's lifecycle is spent as close canopy forestry, a habitat type of little to no ecological value to hen harrier. As highlighted in Article 12 reporting, afforestation is a threat/pressure of high importance for hen harrier.

The removal of closed canopy forestry, which would not otherwise have been felled until maturity and would then be replanted, increases the '*spatial utilisation*' of the area, i.e. by opening up/creating habitats that would not otherwise be available. Another benefit of deforestation is that it reduces negative edge effects for the open habitat that was previously adjacent to forestry. Examples of edge effects include predation of nest sites. Thus removing forestry to create hen harrier foraging habitat is a net positive. As detailed in Appendix 7-7, pre-felling surveys are proposed to be undertaken prior to the commencement of any deforestation works. The timing of deforestation works will be determined based on the results of these surveys, which limits the potential for any disturbance effects. Therefore no significant negative effects are predicted to result from the deforestation of forestry within the Proposed Offsetting Lands.

Furthermore, as all the offsetting measures within agricultural lands follow sound knowledge of restoration ecology from the Hen Harrier Project[15], no significant negative effects are predicted.

7.7.2.1 'Do-Nothing' Effect

If the Proposed Offsetting Measures were not to proceed, existing land use of plantation forestry and agricultural practises within the Proposed Offsetting Lands would continue and the Proposed Offsetting Measures would not take place. *Rhododendron ponticum* stands within the commercial forestry areas of the Proposed Offsetting Lands would likely continue to proliferate.

Commercial forestry is a habitat type of generally low ecological value. As outlined above, and detailed in Appendix 7-7, forestry is generally accepted to be a habitat that is a net negative for hen harrier, as it is only available to hen harrier for a short period while young (i.e. pre thicket). The majority of commercial forestry's lifecycle is spent as closed canopy forestry, a habitat type of little to no ecological value to hen harrier. The forestry within the Proposed Offsetting Lands is closed canopy. If the Proposed Offsetting Measures were not to proceed this forestry would remain closed canopy, and of little to no value for hen harrier, until maturity when it would be felled and would then be replanted. The agricultural land would continue to be managed for intensive continuous grazing.

7.8 Sharing Ecological Data

As a measure to support conservation research and policy, it is proposed to submit the pre-planning survey data and information to the National Biodiversity Data Centre (NBDC) and to BirdWatch Ireland to contribute to the upcoming bird atlas (2027) on relevant ecological records, for example, information on the location of breeding territories and nest sites of bird species of conservation concern. The submission of the data will follow relevant standards and will be provided in the preferred NBDC excel template. This measure will be fulfilled within the first year of the extension of life operation phase in the event of a successful application.

[15] *http://www.henharrierproject.ie/*

7.9 Monitoring

The following monitoring measures are proposed as industry best practice and crucially in response to an identified impacts associated with the Proposed Lifetime Extension. In particular, surveying is proposed to monitor the suitability of the Proposed Offsetting Lands for hen harrier and to confirm whether seasonal restrictions on decommissioning works will be required due to the presence of breeding red grouse and nightjar in the vicinity of the Existing Taurbeg Wind Farm Site.

7.9.1 Pre-Commencement Monitoring

Pre-commencement confirmatory surveys will be undertaken prior to the initiation of works at the Proposed Offsetting Lands. Full details are provided in Appendix 7-8. In summary, the surveys will include a thorough walkover survey within a 500m radius of the works areas, where access allows, in addition to breeding raptor surveys undertaken at two vantage points overlooking the Proposed Offsetting Lands. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring. If the roost/nest is found to be active no works shall be undertaken, works will cease within a species-specific buffer of this location in line with best practice guidance (Forestry Commission Scotland, 2006; Goodship and Furness, 2022; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied.

7.9.2 Operation

A detailed Bird Monitoring Programme has been prepared for the extended operational phase of the existing wind farm (refer to Appendix 7-8 for further details). The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the extended operational phase. Surveys will be scheduled to coincide with Years 1, 2, 3, 5, and 10 of the extended operational lifetime of the wind farm. Monitoring measures are broadly based on guidelines issued by NatureScot (SNH, 2009). The following individual components are proposed:

- Existing Taurbeg Wind Farm Site
  - **Vantage Point Surveys** at the Site undertaken monthly from VP1, VP2, VP3 and VP4 (locations as shown in Figure 7-1) in years 1, 2, 3, 5 and 10.
  - **Breeding Walkover Surveys** (adapted Brown & Shepherd) undertaken at the Site monthly from April to July (locations as shown in Figure 7-4) in years 1, 2, 3, 5 and 10.
  - **Targeted bird collision surveys** (corpse searches) will be undertaken by a trained dog and handler. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust. Undertaken monthly in in years 1, 2, 3, 5 and 10.

- Proposed Offsetting Lands
  - **Breeding Raptor Surveys** at the Proposed Offsetting Lands undertaken monthly from March to August, following Hardey *et al.* (2013), in each year of 10-year Proposed Lifetime Extension.
  - **Passerine Monitoring Surveys** at the Proposed Offsetting Lands undertaken over two visits between April to June, following CBS methodology, in each year of 10-year Proposed Lifetime Extension.
  - **Habitat Monitoring** at the Proposed Offsetting Lands undertaken in each of the 10 years of the Extension of Life.

Full details of all monitoring protocols for the wind farm are provided in Appendix 7-8.

7.9.3 Decommissioning

Decommissioning monitoring surveys will be undertaken prior to the commencement of works associated with decommissioning at the Site. Additionally, if works are to continue into the breeding season, surveys will be required monthly from April to July. The survey will include a thorough walkover survey to a 500m radius of the development footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified during the decommissioning phase (e.g. red grouse or nightjar), no works shall be undertaken within a species-specific disturbance buffer (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007; Goodship and Furness, 2022) in line with industry best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.

7.10 Residual Effects

The following species were identified as KORs and were subject to detailed impact assessment:

- Hen Harrier (breeding)
- Golden Plover (wintering)
- Nightjar (breeding)
- Short-eared Owl (all seasons)
- Kestrel (all seasons)
- Red Grouse (all seasons)
- Snipe (wintering)
- Buzzard (all seasons)
- Sparrowhawk (all seasons)

Taking into consideration the effect significance levels identified and the Proposed Offsetting Plan and proposed best practice and mitigation, significant residual effects on the KORs with regard to direct habitat loss, disturbance/displacement or collision mortality are not anticipated. Following the measures described in Section 7.6 and the implementation of the Proposed Offsetting Plan, no effect significance greater than ***Low,*** as per Percival (2003) and ***Slight*** as per the EPA (2022) criteria, was identified for any KOR.

7.11 Cumulative Effects

As per NatureScot guidance "Assessing the Cumulative Impacts of onshore Wind Energy Developments" (SNH, 2012), cumulative effects arising from two or more developments may be:

- **Additive** (a multiple independent additive model)
- **Antagonistic** (the sum of impacts are less that in a multiple independent additive model)
- **Synergistic** (the cumulative impact is greater than the sum of the multiple individual effects)

This section first identifies other plans and projects in the vicinity of the Site and then assesses the potential for additive, antagonistic or synergistic impacts to occur.

7.11.1 Other Plans and Projects

Assessment material was compiled for relevant developments within the vicinity of the Site. The material was gathered through a search of relevant online Planning Registers, reviews of relevant EIS/EIAR documents, planning application details and planning drawings. It served to identify past and future plans and projects, their activities and their environmental impacts. These are then considered for in-combination or cumulative effects with the Proposed Lifetime Extension. All plans and projects reviewed are outlined below.

7.11.1.1 Plans Considered in the Cumulative Impact Assessment

The following plans were considered in the cumulative impact assessment:

- Cork County Development Plan 2022–2028
- Kerry County Development Plan 2022-2028
- National Biodiversity Action Plan 2023-2030
- Southern Regional Assembly Regional Spatial and Economic 2020-2040 Strategy (RSES)

7.11.1.2 Projects Considered in the Cumulative Impact Assessment

NatureScot guidance (SNH, 2012; 2018) was consulted while undertaking the cumulative assessment. SNH (2012; 2018) emphasises that its priority is to 'maintain the conservation status of the species population at the national level.' However, it is acknowledged that consideration should also be allowed for impacts at the regional level 'where regional impacts have national implications (for example where a specific region holds the majority of the national population)'. The cumulative impact assessment has been carried out at the landscape level. The upland area of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA has been chosen as the focus for the cumulative assessment for two key reasons:

- Firstly, the Site is sited in these wider uplands; and
- Secondly, the SPA is largely one coherent ecological unit that contains a contiguous mosaic of similar habitats that likely contain similar species as occurred within the Site.

To conduct the cumulative impact assessment, local authority and An Bord Pleanála online planning registers, relevant EIAR (or EIS) documents, planning application details and planning drawings in the vicinity of the Site and all associated works were reviewed to identify past and future projects, their activities and their environmental impacts. The findings of this review are outlined in the following sections.

7.11.1.2.1 *Developments/Landuses*

The review of the County Council planning register identified relevant general development planning applications in the vicinity of the Site. Most of these relate to the provision and/or alteration of one-off rural housing and agriculture-related structures, as described in Chapter 2 of the EIAR. Owing to the scale and nature of these developments, significant cumulative impacts are not anticipated.

Of the total SPA area, the two main land management uses in these uplands are forestry and agriculture. These landuses are assessed as part of a wider landscape-level cumulative assessment provided in Section 7.11.2.1 further below.

7.11.1.2.2 *Other Wind Farm Developments*

Existing, permitted and proposed wind farm projects within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA are provided in Table 7-11, For further detail see Chapter 2 of this EIAR.

Table 7-11 Wind energy developments within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

Wind Farm	Status	Number of Turbines	Approximate Distance to nearest Turbine (km)	County
Knockacummer Wind Farm	Operating	29	2.5km	Co. Cork
Glentane Wind Farm	Operating	11	2.7km	Co. Cork
Coollegrean Wind Farm	Operating	7	8.8km	Co. Kerry
Dromdeeveen Wind Farm	Operating	14	9.6km	Co. Limerick
Cordal Wind Farm	Operating	28	9.9km	Co. Kerry
Knockawarriga Wind Farm 1	Operating	9	10.9km	Co. Limerick
Knockawarriga Wind Farm 2	Operating	3	11.1km	Co. Limerick
Mauricetown/ Ashford Wind Farm	Operating	6	11.2km	Co. Limerick
Mount Eagle Wind Farm	Operating	8	12.4km	Co. Kerry
Gortnacloghy Wind Farm	Operating	2	12.4km	Co. Limerick
Ballagh Wind Farm	Operating	2	12.8km	Co. Limerick
Tournafulla Wind Farm	Operating	18	14.2km	Co. Limerick
Rathcahill Wind Farm	Operating	5	14.9km	Co. Limerick
Glanaruddery 1	Operating	10	20.7km	Co. Kerry

Wind Farm	Status	Number of Turbines	Approximate Distance to nearest Turbine (km)	County
Glanaruddery 2	Operating	1	23.7km	Co. Kerry
Dromada	Operating	19	21.1km	Co. Limerick
Athea	Operating	16	21.1km	Co. Limerick
Cloghboola	Operating	16	21.6km	Co. Kerry
Glantaunyalkeen	Operating	3	22.5km	Co. Kerry
Muingnaminnane	Operating	18	26.3km	Co. Kerry
Cahercullenagh	Operating	11	27.1km	Co. Kerry
Knocknagoum 1	Operating	9	27.1km	Co. Kerry
Knocknagoum 2 / Maghanknockane Wind Farm	Operating	6	30.1km	Co. Kerry
Tursillagh 1	Operating	23	31.4km	Co. Kerry
Tursillagh 2	Operating	8	30.9km	Co. Kerry
Ballincollig Hill	Operating	8	30.4km	Co. Kerry
Beenageeha	Operating	6	29.6km	Co. Kerry
Cloghaneleskirt	Operating	5	28.3km	Co. Kerry
Clahane / Pallas	Operating	26	28.3km	Co. Kerry
Grouse Lodge	Operating	6	29.1km	Co. Limerick

Existing Knockacummer Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Knockacummer Wind Farm was considered. The existing Knockacummer Wind Farm is situated approximately 800m north-east of the Taurbeg turbine layout, and is located within an area of commercial forestry with some areas of heath/scrub and agricultural grassland (source: Google satellite imagery dated May 2023). The existing Knockacummer Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS[16] for existing Knockacummer Wind Farm was consulted. No KORs are identified in the EIS, however hen harrier was considered in detail in the impact assessment. The EIS identified the potential for possible cumulative impacts and possible disturbance/displacement impacts on the local hen harrier population. As such, compensatory habitat was proposed in addition to mitigation measures. Mitigation

[16] https://planning.corkcoco.ie/ePlan/AppFileRefDetails/048354/0

measures included siting turbines a minimum of 500m from any known nest locations and management of vegetation around turbines bases to discourage high density of prey animals which could encourage birds to turbines.

Existing Glentane Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Glentane Wind Farm was considered. The existing Glentane Wind Farm is situated approximately 2km south-west of the Taurbeg turbine layout, and is located within an area of heath, commercial forestry an agricultural grassland (source: Google satellite imagery dated May 2023). The existing Glentane Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Glentane Wind Farm, for the both the original application and modification application, were not available on the planning file[17]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Glentane Wind Farm I turbines, i.e. hen harrier, golden plover, short-eared owl, kestrel, red grouse, snipe, buzzard and sparrowhawk

Existing Coollegrean Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Coollegrean Wind Farm was considered. The existing Coollegrean Wind Farm is situated approximately 8.5km west of the Taurbeg turbine layout, and is located within an area of felled commercial forestry, heath and some areas of active commercial forestry (source: Google satellite imagery dated May 2023). The existing Coollegrean Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The submitted EIS[18] for existing Coollegrean Wind Farm was consulted, as was the EIAR[19] submitted for the consented extension of life application from 20 years to 25 years. There is very limited information on birds available in the original EIS. The original EIS assessed collision risk and displacement for the operational phase of the existing Coollegrean Wind Farm development. Collision risk and displacement were assessed as not significant for all species. Note: collision risk was assessed based on published research and avoidance rates and a collision risk model was not conducted as part of the EIS.

The extension of life EIAR shared the following KORs with the Proposed Lifetime Extension: hen harrier, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk. The EIAR for extension of life for existing Coollegrean Wind Farm assessed collision risk, displacement and disturbance. In relation to collision risk for hen harrier, the EIAR concluded that "*the risk of hen harriers colliding with the turbines is not considered significant*". In relation to displacement for hen harrier, the EIAR concluded that the proposed lifetime extension "*will not result in significant displacement impacts on hen harrier*". In relation to disturbance to hen harrier, the EIAR concluded that "*the operation phase of the Coolegrean Windfarm, including the proposed five year lifetime extension, will not result in increased disturbance to nesting hen harriers*". In relation to golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk, the EIAR similarly concluded that the operation phase of the Coolegrean Windfarm, including the proposed five year lifetime extension, will not result in significant impacts.

[17] https://planning.corkcoco.ie/ePlan/AppFileRefDetails/064077/0
[18] https://www.eplanning.ie/KerryCC/AppFileRefDetails/061489/0
[19] https://www.eplanning.ie/KerryCC/AppFileRefDetails/171193/0

Existing Dromdeeveen Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Dromdeeveen Wind Farm was considered. The existing Dromdeeveen Wind Farm is situated approximately 8.5km north-east of the Taurbeg turbine layout, and is located within commercial forestry with some improved agricultural grassland and small areas of heath/bog (source: Google satellite imagery dated May 2023). The existing Dromdeeveen Wind Farm is situated partially within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for existing Dromdeeveen Wind Farm was not available on planning file[20]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Dromdeeveen Wind Farm turbines, i.e. hen harrier, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Cordal Wind Farm I

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Cordal Wind Farm I was considered. The existing Cordal Wind Farm I is situated approximately 9km west of the Taurbeg turbine layout, and is located within almost entirely commercial forestry habitat, with some areas of heath/bog within a 500m turbine radius (source: Google satellite imagery dated May 2023). The existing Cordal Wind Farm I is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Cordall Wind Farm I was not available on planning file[21]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Cordall Wind Farm I turbines, i.e. hen harrier, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Cordal Wind Farm II

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Cordal Wind Farm II was considered. The existing Cordal Wind Farm II is situated approximately 9.5km south-west of the Taurbeg turbine layout, and is located within almost entirely commercial forestry habitat, with some areas of heath/bog within a 500m turbine radius (source: Google satellite imagery dated May 2023). The existing Cordal Wind Farm II is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS[22] for existing Cordal Wind Farm II was consulted. The EIS assessed collision risk and displacement for the operational phase of the existing Cordal Wind Farm II development. While no KORs were identified in the EIS, the following species were noted to occur at the Cordal Wind Farm II site which are shared as KORs of the Proposed Lifetime Extension: hen harrier, golden plover, short-eared owl, kestrel red grouse and snipe. No significant impacts were predicted for any species.

Existing Knockawarriga Wind Farm 1 & 2

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Knockawarriga Wind Farm I & 2 was considered. The existing Knockawarriga Wind Farm I & 2 is situated approximately 10.9km north of the Taurbeg turbine layout, and is located within a mix of commercial forestry, agricultural grassland and heath/bog

[20] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/021871/0
[21] https://www.eplanning.ie/KerryCC/AppFileRefDetails/033977/0
[22] https://www.eplanning.ie/KerryCC/AppFileRefDetails/072633/0

habitats (source: Google satellite imagery dated May 2023). The existing Knockawarriga Wind Farm I & 2 is situated partially within (one of the combined 12 turbines) the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for original application for existing Knockawarriga Wind Farm I was not available on planning file[23], nor was the EIS for the consented and built application for increase in turbine dimensions available on planning file[24]. However, the EIS[25] for Phase II for the additional three turbines was consulted. No KORs are identified in the EIS, however hen harrier was considered in detail in the impact assessment. The EIS assessed collision risk and displacement for the operational phase of the existing Knockawarriga Wind Farm 2 development. In relation to displacement, the EIS concluded that "*potential disturbance to the foraging activity by hen harriers in the site due to the presence of the turbines is likely to be of low significance and would not affect the conservation status of the local population*". It also stated "*To mitigate for the loss of foraging habitat associated with the proposed development, it is proposed to provide an equivalent area of suitable foraging habitat for Hen Harriers during the lifetime of the project*". In relation to collision risk, the EIS concluded "*that the chances of a hen harrier colliding with a turbine at the proposed wind farm site is negligible"* based on observed activity at the site and flight heights of birds observed.

Existing Mauricetown/ Ashford Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Mauricetown/Ashford Wind Farm was considered. The existing Mauricetown Wind Farm is situated approximately 10.5km north-east of the Taurbeg turbine layout, and is located in agricultural grassland habitat (source: Google satellite imagery dated May 2023). The existing Mauricetown Wind Farm is situated partially within (one of six turbines) the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS[26] for existing Mauricetown Wind Farm was consulted. While no KORs were identified in the EIS, the following species were noted to occur at the Cordal Wind Farm II site which are shared as KORs of the Proposed Lifetime Extension: hen harrier, kestrel and snipe, with only hen harrier brought forward for detailed assessment. The EIS assessed the potential for collision and displacement effects to hen harrier from the operational period of the existing Mauricetown Wind Farm. The risk of hen harrier colliding with turbines was considered "*low*", based on published research. A "*long-term moderate negative* impact" was identified for hen harrier from displacement during operational phase. Regarding cumulative effects in relation to this effect of displacement of suitable hen harrier habitat, the EIS states that "*when assessed with the effects of other wind turbines in the surroundings the impact is more likely to be of significance*". Compensatory habitat was proposed of an equivalent area to the area of suitable hen harrier habitat lost to displacement.

Existing Mount Eagle Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Mount Eagle Wind Farm was considered. The existing Mount Eagle Wind Farm is situated approximately 12km west of the Taurbeg turbine layout and c. 500m north of the Proposed Offsetting Lands. Mount Eagle Wind Farm is located in commercial forestry habitat with an adjacent area of heath habitat (source: Google satellite imagery dated May 2023). The existing Mount Eagle Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

[23] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/021937/0
[24] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/041289/0
[25] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/12459/0
[26] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/12379/0

The EIS for the existing Mount Eagle Wind Farm was not available on planning file[27]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Mount Eagle Wind Farm I turbines, i.e. hen harrier, golden plover, short-eared owl, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Gortnacloghy Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Gortnacloghy Wind Farm was considered. The existing Gortnacloghy Wind Farm is situated approximately 12.4km north of the Taurbeg turbine layout, and is located in wet grassland and commercial forestry habitat (source: Google satellite imagery dated May 2023). The existing Gortnacloghy Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Gortnacloghy Wind Farm was not available on planning file[28]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Gortnacloghy Wind Farm I turbines, i.e. hen harrier, golden plover, kestrel, snipe, buzzard and sparrowhawk.

Existing Ballagh Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Ballagh Wind Farm was considered. The existing Ballagh Wind Farm is situated approximately 12.8km north of the Taurbeg turbine layout, and is located in wet grassland and improved grassland habitat (source: Google satellite imagery dated May 2023). The existing Ballagh Wind Farm is situated partly (one of two turbines) within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS[29] for the existing Ballagh Wind Farm was consulted. There is limited information pertaining to birds within the EIS, with hen harrier the only species discussed. No significant impacts were identified in the EIS.

Existing Tournafulla Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Tournafulla Wind Farm was considered. The existing Tournafulla Wind Farm is situated approximately 13.5km north of the Taurbeg turbine layout, and is located in agricultural grassland habitat with some smaller areas of wet grassland (source: Google satellite imagery dated May 2023). The existing Tournafulla Wind Farm is situated partially within (seven of 18 turbines) the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Tournafulla Wind Farm not available on the planning file, either for the original application[30], or extension of duration application[31]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Tournafulla Wind Farm turbines, i.e. hen harrier, golden plover, kestrel, snipe, buzzard and sparrowhawk.

[27] https://www.eplanning.ie/KerryCC/AppFileRefDetails/013884/0
[28] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/043021/0
[29] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/06128/0
[30] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/01406/0
[31] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/062455/0

Existing Rathcahill Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Rathcahill Wind Farm was considered. The existing Rathcahill Wind Farm is situated approximately 14.5km north of the Taurbeg turbine layout, and is located in agricultural grassland habitat (source: Google satellite imagery dated May 2023). The existing Rathcahill Wind Farm turbines are situated outside of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, however parts of the site fall within the SPA.

The EIS[32] for the existing Rathcahill Wind Farm was consulted. There is little to no information pertaining to birds within the EIS. Hen harrier are mentioned as potentially utilising the site for foraging or nesting in the surrounding area. No significant impacts were identified.

Existing Glanaruddery Wind Farm 1 & 2

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Glanaruddery Wind Farm 1 & 2 was considered. The existing Glanaruddery Wind Farm 1 & 2 is situated approximately 20.7km west of the Taurbeg turbine layout, and is located in predominantly commercial forestry with some areas of heath and agricultural grassland (source: Google satellite imagery dated May 2023). The existing Glanaruddery Wind Farm 1 & 2 is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS[33], and appended ecology report, for the existing Glanaruddery Wind Farm 1 (ten turbines) was consulted. The EIS did not identify KORs, however the following species which are shared as KORs of the Proposed Lifetime Extension were included in the impact assessment: hen harrier, short-eared owl and red grouse. The EIS assessed displacement and collision risk for these species during the operational phase. No significant effects were identified.

The EIS[34], and its appended Ecological Impact Assessment Report, for the existing one turbine extension (Glanaruddery Wind Farm 2) was also consulted. The EIS shared the following KORs with the Proposed Lifetime Extension: hen harrier. The EIS assessed displacement and collision risk to hen harrier during the operational phase. No significant effects were identified.

Existing Dromada Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Dromada Wind Farm was considered. The existing Dromada Wind Farm is situated approximately 21.1km north of the Taurbeg turbine layout, and is located in a mix of heath/rough grassland, commercial forestry and agricultural grassland habitat (source: Google satellite imagery dated May 2023). The existing Dromada Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Dromada Wind Farm was not available on the planning file[35]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Dromada Wind Farm turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

[32] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/07281/0
[33] https://www.eplanning.ie/KerryCC/AppFileRefDetails/10571/0
[34] https://www.eplanning.ie/KerryCC/AppFileRefDetails/12623/0
[35] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/031343/0

Existing Athea Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Athea Wind Farm was considered. The existing Athea Wind Farm is situated approximately 21.1km north of the Taurbeg turbine layout, and is located in a mix of heath/rough grassland, commercial forestry and agricultural grassland habitat (source: Google satellite imagery dated May 2023). The existing Athea Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the original application was not available on the planning file[36]. Similarly, the EIS submitted for the amended application was not available on the planning file[37]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Dromada Wind Farm turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Cloghboola Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Cloghboola Wind Farm was considered. The existing Cloghboola Wind Farm is situated approximately 21.6km north-west of the Taurbeg turbine layout, and is located in predominantly heath/rough grassland with some agricultural grassland and commercial forestry habitat (source: Google satellite imagery dated May 2023). The existing Cloghboola Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the original application for 24 turbines was not available on the planning file[38]. The EIS[39] for amendments to the granted development (i.e. the existing Cloghboola Wind Farm) was consulted. The EIS assessed collision risk and displacement for hen harrier during the operational phase. In relation to collision risk, the EIS concluded "*based on levels of flying activity recorded in the Cloghboola Study Area in 2009, and previous studies, the risk of adult Hen Harrier colliding with turbines is considered low*". In relation to displacement, the EIS concluded "*it is anticipated that Hen Harrier will continue to hunt within the proposed site following the construction of the wind farm, although it is likely that there will be some degree of turbine avoidance shown by hunting birds (Pierce Higgins et al, 2009). This impact would be similar for the amended plan and the consented layout*". The EIS also assessed impacts to golden plover and red grouse during operational phase. No significant impacts were identified.

Existing Muingnaminnane Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Muingnaminnane Wind Farm was considered. The existing Muingnaminnane Wind Farm is situated approximately 26.3km west of the Taurbeg turbine layout, and is located in mature commercial forestry habitat (source: Google satellite imagery dated May 2023). The existing Muingnaminnane Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Muingnaminnane Wind Farm was not available on the planning file[40]. However, based on a review of habitats present, there is potential for KOR species of the Proposed

[36] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/03357/0
[37] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/042552/0
[38] https://www.eplanning.ie/KerryCC/AppFileRefDetails/004099/0
[39] https://www.eplanning.ie/KerryCC/AppFileRefDetails/10616/0
[40] https://www.eplanning.ie/KerryCC/AppFileRefDetails/01635/0

Lifetime Extension to occur within a 500m radius of the existing Muingnaminnane Wind Farm turbines, i.e. hen harrier, kestrel, snipe, buzzard and sparrowhawk.

Existing Cahercullenagh Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Cahercullenagh Wind Farm was considered. The existing Cahercullenagh Wind Farm is situated approximately 27.1km west of the Taurbeg turbine layout, and is located in predominantly heath habitat with some areas of agricultural grassland (source: Google satellite imagery dated May 2023). The existing Cahercullenagh Wind Farm is situated within partly the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (six of the 11 turbines).

The EIS for the existing Cahercullenagh Wind Farm was not available on the planning file[41]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Cahercullenagh Wind Farm turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Knocknagoum Wind Farm 1

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Knocknagoum Wind Farm 1 was considered. The existing Knocknagoum Wind Farm 1 is situated approximately 27.1km north-west of the Taurbeg turbine layout, and is located in a mix of commercial forestry and heath habitat (source: Google satellite imagery dated May 2023). The existing Knocknagoum Wind Farm 1 is situated within partly the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (eight of the nine turbines).

Only the Non-Technical Summary (NTS) of the EIS for the existing Knocknagoum Wind Farm 1 was available on the planning file[42]. In relation to collision risk, the EIS states "*studies to-date indicate that the potential impact of this collision risk is not likely to cause a threat to local bird populations, except under exceptional circumstances. Based on levels of flying activity recorded in the Knocknagoum Study area in 2009, the risk of adult Hen Harriers colliding with turbines is considered low. However, the collision risk for juvenile birds from a nest within 500m of a turbine could potentially be much higher during the two to three week post fledging period*". In relation to displacement, the EIS states the development "*could potentially cause direct displacement of breeding Hen Harriers in the area, as a pair successfully bred within 500m of a proposed turbine location in 2009. However, there is evidence that Hen Harriers will nest within 200 to 300m of turbines (Whitfield & Madders, 2005)*". As part of conditions of planning, compensatory habitat for hen harrier of 19.2 hectares was proposed at Gortclohy, Co. Kerry for the duration of the wind farm.

Existing Beenageeha Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Beenageesha Wind Farm was considered. The existing Knocknagoum Wind Farm 2 is situated approximately 29.6km north-west of the Taurbeg turbine layout, and is located in an area of open heath habitat (source: Google satellite imagery dated May 2023). The existing Knocknagoum Wind Farm 2 is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Beenageesha Wind Farm was not available on the planning file[43]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime

[41] https://www.eplanning.ie/KerryCC/AppFileRefDetails/01635/0
[42] https://www.eplanning.ie/KerryCC/AppFileRefDetails/10874/0
[43] https://www.eplanning.ie/KerryCC/AppFileRefDetails/032676/0

Extension to occur within a 500m radius of the existing Beenageesha Wind Farm turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Knocknagoum Wind Farm 2 / Maghanknockane Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Knocknagoum Wind Farm 2 was considered. The existing Knocknagoum Wind Farm 2 is situated approximately 30.1km north-west of the Taurbeg turbine layout, and is located in an area of open heath habitat with some commercial forestry (source: Google satellite imagery dated May 2023). The existing Knocknagoum Wind Farm 2 is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Knocknagoum Wind Farm 2 was not available on the planning file[44]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Knocknagoum Wind Farm 2 turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Tursillagh Wind Farm 1

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Tursillagh Wind Farm 1 was considered. The existing Tursillagh Wind Farm 2 is situated approximately 31.4km north-west of the Taurbeg turbine layout, and is located in an area of open heath habitat with some commercial forestry habitat (source: Google satellite imagery dated May 2023). The existing Tursillagh Wind Farm 1 is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Tursillagh Wind Farm 1 was not available on the planning file[45]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Tursillagh Wind Farm 1 turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Tursillagh Wind Farm 2

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Tursillagh Wind Farm 2 was considered. The existing Tursillagh Wind Farm 2 is situated approximately 30.9km north-west of the Taurbeg turbine layout, and is located in predominantly commercial forestry habitat with some bordering heath (source: Google satellite imagery dated May 2023). The existing Tursillagh Wind Farm 2 is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Tursillagh Wind Farm 2 was not available on the planning file[46]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Tursillagh Wind Farm 2 turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Ballincollig Hill Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Ballincollig Hill Wind Farm was considered. The existing Ballincollig Hill Wind Farm is situated approximately 30.4km north-west of the Taurbeg turbine layout,

[44] https://www.eplanning.ie/KerryCC/AppFileRefDetails/032676/0
[45] https://www.eplanning.ie/KerryCC/AppFileRefDetails/971865/0
[46] https://www.eplanning.ie/KerryCC/AppFileRefDetails/01390/0

and is located in an area of open heath habitat with some commercial forestry habitat (source: Google satellite imagery dated May 2023). The existing Ballincollig Hill Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Ballincollig Hill Wind Farm was not available on the planning file[47]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Ballincollig Hill Wind Farm turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Cloghaneleskirt Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Cloghaneleskirt Wind Farm was considered. The existing Cloghaneleskirt Wind Farm is situated approximately 28.3km north-west of the Taurbeg turbine layout, and is located in an area of predominantly commercial forestry habitat (source: Google satellite imagery dated May 2023). The existing Cloghaneleskirt Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Cloghaneleskirt Wind Farm was not available on the planning file[48]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Cloghaneleskirt Wind Farm 2 turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Clahane / Pallas Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Clahane/Pallas Wind Farm was considered. The existing Clahane/Pallas Wind Farm is situated approximately 28.3km north-west of the Taurbeg turbine layout, and is located in an area of predominantly open heath habitat with some areas of commercial forestry and agricultural grassland (source: Google satellite imagery dated May 2023). The existing Clahane/Pallas Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS for the existing Clahane/Pallas Wind Farm was not available on the planning file[49]. However, based on a review of habitats present, there is potential for KOR species of the Proposed Lifetime Extension to occur within a 500m radius of the existing Clahane/Pallas Wind Farm 2 turbines, i.e. hen harrier, short-eared owl, golden plover, kestrel, red grouse, snipe, buzzard and sparrowhawk.

Existing Grouse Lodge Wind Farm

The potential for the Proposed Lifetime Extension to result in significant cumulative or in-combination effects when assessed alongside the existing Grouse Lodge Wind Farm was considered. The existing Grouse Lodge Wind Farm is situated approximately 29.1km north of the Taurbeg turbine layout, and is located in an area of predominantly open heath habitat with some areas of commercial forestry and agricultural grassland (source: Google satellite imagery dated May 2023). The existing Grouse Lodge Wind Farm is situated within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

The EIS[50] for the existing Grouse Lodge Wind Farm was consulted. There is limited information on birds in the EIS. The EIS assessed potential impacts to hen harrier and concluded: "*Overall the impact*

[47] https://www.eplanning.ie/KerryCC/AppFileRefDetails/023135/0
[48] https://www.eplanning.ie/KerryCC/AppFileRefDetails/031264/0
[49] https://www.eplanning.ie/KerryCC/AppFileRefDetails/012720/0
[50] https://www.eplanning.ie/LimerickCCC/AppFileRefDetails/0858/0

on hen harrier by the proposed scheme, which has only six turbines, is likely to be negligible or neutral in the long-term as the habitats on site are likely to become more suitable for foraging when trees are removed".

7.11.2 Assessment of Cumulative Effects

There were nine KORs identified: hen harrier, golden plover, nightjar, short-eared owl, kestrel, red grouse, snipe, buzzard and sparrowhawk. A key consideration in the assessment of the potential for cumulative impacts to result in significant effects on KORs is proximity and whether the projects under consideration all contain suitable habitats for the species in question. The cumulative impact assessment has been carried out at the landscape level. The upland area of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA has been chosen as the focus for the cumulative assessment for two key reasons:

- Firstly, the Site is sited in these wider uplands; and
- Secondly, the SPA is largely one coherent ecological unit that contains a contiguous mosaic of similar habitats that likely contain similar species as occurred within the Site.

7.11.2.1 Landscape-Level Assessment

A GIS mapping exercise was undertaken that aimed to, firstly, quantify the amount of land within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA) and secondly apportion the associated land management practices.

Of the total SPA area (56,673ha)[51], the two main land management uses in these uplands are forestry and agriculture which is the 'open habitat' mentioned below. When considering turbines in the analysis, impacts were predicted to be restricted to the area near a turbine. Near to a turbine was defined as within the range of 250m to 500m. This distance was chosen as Pearce-Higgins *et al.* (2009) identified, for a range of species, significant avoidance of turbines between 250m and 500m. It therefore follows that significant effects are unlikely at distances greater than 500m. Please note that (for the reasons outlined above) where a wind farm straddled the SPA boundary only turbines within 500m were included in the analysis. The GIS exercise provided the following results (see Figure 7-11 below).

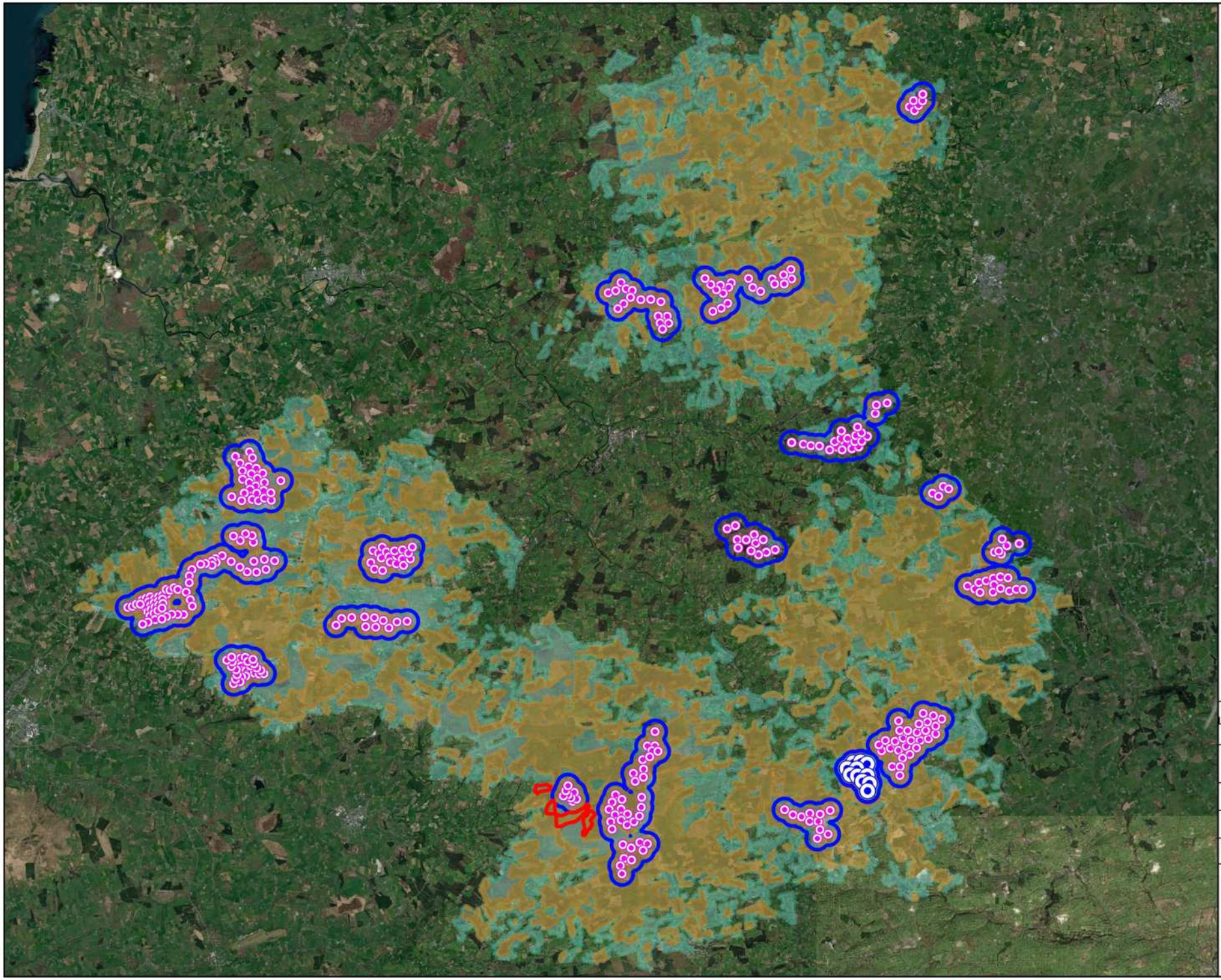
- The total area of forestry within SPA = 27,225ha (48% of the total SPA area);
  - Forestry greater than 250-500m from existing turbines (excl. Taurbeg turbine layout) = 25,304 and 23,467ha respectively (or approx. 93% and 86% respectively of the forestry).
  - Forestry greater than 250-500m from existing turbines (incl. Taurbeg turbine layout) = 25,267-23,345ha (or approx. 93% and 86% of the forestry).
- The total area of open habitat within SPA = 29,414ha (51.9% of the SPA area);
  - As outlined in the site-specific conservation objectives[52], of this total 10,366ha is heath/bog and 9,783ha is low-intensity managed grassland.
  - Open areas greater than 250-500m from existing turbines (excl. Taurbeg turbine layout) = 27,493ha and 25,656ha respectively (or 93.5% and 87.2% of the open habitat).
  - Open areas greater than 250-500m from existing turbines (incl. Taurbeg turbine layout) is 27,300ha and 25,224ha respectively (or approx. 93% and 86% of the open habitat).
- The total area within 250-500m of existing turbines = 4,072ha and 8,071ha respectively (or 7.2% and 14.2% of the SPA area);

[51] *NPWS (2022). Conservation Objectives Supporting Document: Breeding Hen Harrier. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage*
[52] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004161.pdf

Having undertaken the above analysis of the available area within the surrounding SPA the following is of note:

- The majority of the SPA is comprised of 'open habitats' (52%).
- A significant portion of the land cover of the SPA is commercial forestry (48%). As noted during the 2022 national survey this is likely the key pressure acting on hen harrier within the SPA "a substantial factor affecting the distribution and abundance of hen harrier in this region."
- Although there is a high density of turbines in the SPA, relative to other regions, the area occupied by the turbines (plus a 250-500m radius) is small to moderate in size when compared to the other key industries of commercial forestry and agriculture.
- Displacement effects associated with the 11 no turbines of the existing Taurbeg Wind Farm account for <1% of the SPA area.

As forestry and agriculture (i.e. open habitat) make up the vast majority of the total 56,673ha within the SPA it is reasonable to conclude that the relative quality/suitability of these habitats is likely to have the greatest (positive or negative) influence on the local avian community, including hen harrier. While many of the species encountered at the Site are in decline at a national level, it is not possible to conclusively attribute the decline to any one industry, though likely, the national hierarchy of threats/pressures as per Article 12 reporting holds true locally also. That is; forestry practice (including forest planting on open ground and forestry management) and the modification of cultivation practices are of high to medium importance. Impacts associated with wind farms (renewable abiotic energy use) are likely of medium importance locally. Please see the following species-specific impact assessment for a detailed discussion of cumulative effects.


Map Legend
Taurbeg Turbine Layout
Existing Turbines
Proposed Offsetting Lands
500m Turbine Radius
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA
Forestry
Microsoft product screen shots reprinted with permission from Microsoft Corporation
N
Drawing Title
Landscape-Level Cumulative Assessment Forestry Habitat within SPA
Project Title
Taurbeg Wind Farm Extension of Operational Life
Drawn By
D. Woods
Checked By
P. Cregg
Project No.
231030
Drawing No.
Fig. 7-11
Scale
1:220,000
Date
17.04.2025
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7.11.2.2 Hen Harrier (National Importance)

The Hen Harrier Threat Response Plan 2024-2028 states:

> *"While wind energy production is identified as one of the key pressures on the species, wind energy development is also, more generally, a key part of the global and national response to alleviating climate change. Biodiversity and climate change commitments have equal standing, and creating opportunities to achieve both, without compromising each other, is critical, particularly as biodiversity can assist in climate change mitigation and adaptation."*

This application includes a comprehensive Offsetting Plan to ensure the existing Taurbeg Wind Farm avoids any future contribution to a significant cumulative effect, particularly for the hen harrier of the SPA.

The decline in hen harrier populations in Ireland is a result of human related pressures, in particular habitat modification and loss. The industries that most closely overlap with the distribution of hen harrier in the surrounding uplands are commercial forestry, agriculture, and wind farms. As outlined in Article 12 reporting[53] the key threats/pressures acting on hen harrier relate to forestry practise (including forest planting on open ground and forestry management) and the modification of cultivation practices. These threats/pressures are described as of high importance. Impacts associated with wind farms (renewable abiotic energy use) are classified as of medium importance. The recently drafted Threat Response Plan for the Hen Harrier 2024-2028 prepared by NPWS includes a comparable summary of the Article 12 threat/pressures. Similarly, the cause of the local SPA population decline is likely multi-faceted, with the same key threats/pressures implicated, i.e. afforestation, agricultural intensification and impacts associated with wind farms. Although impacts associated with forestry could be having an outsized influence on hen harrier's declining numbers within the SPA, such an argument would be largely academic as all threats and pressures are acting in combination.

Although the decline of the SPA population is acknowledged and the proliferation of turbines is likely one of the factors implicated in the decline, the Proposed Lifetime Extension will not contribute to a significant cumulative effect based on the following rationale.

- The successful implementation of the Proposed Offsetting Plan that accompanies this application ensures that the retention of the existing Taurbeg turbines is not at the expense of suitable hen harrier habitats. The continuing operation of the existing Taurbeg Wind Farm could not contribute to a significant cumulative effect, if (as is proposed) there is no net loss of habitat while maintaining the overall coherence of the Natura 2000 network. Please see Appendix 7-7 for further discussion on justifications.
- The nature of the Proposed Lifetime Extension, an extension of life application, means that it maintains the status quo. That is, no additional effects are predicted, e.g. no disturbance from construction works. Furthermore, in the event of a 10-year extension of life, a more environmentally friendly decommissioning protocol would be followed.
- "*While wind energy production is identified as one of the key pressures on the species, wind energy development is also, more generally, a key part of the global and national response to alleviating climate change.*" (Hen Harrier Threat Response Plan 2024-2028).

Significant cumulative effects are not predicted.

[53] https://cdr.eionet.europa.eu/Converters/run_conversion?file=/ie/eu/art12/envxztxxq/IE_birds_reports_20191031-130157.xml&conv=612&source=remote

7.11.2.3 Wintering Golden Plover (County Importance)

Golden plover favours the open habitats of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. There is 25,224ha of open habitat greater than 500m from a turbine in the SPA. This constitutes a significant amount of upland habitat.

The potential for developments at the wider landscape-level to result in significant cumulative or in-combination effects when assessed alongside the Proposed Lifetime Extension were considered. No significant effects were reported for golden plover in the data available from any of the wind farms located within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA). This species was recorded infrequently at the existing Taurbeg Wind Farm. No significant effects were predicted to result from the Proposed Lifetime Extension.

The low rate of occurrence of this species in the surrounding uplands and within the existing Taurbeg Wind Farm limits the potential for significant cumulative effect. This species is more numerous in lowland areas in the winter. In addition, the Proposed Offsetting Plan provides for auxiliary and wider ecosystem gains. While the Proposed Offsetting Plan targets benefits for hen harrier other species that share similar habitat requirements such as golden plover will also benefit. In particular, deforestation will create open habitats that would be favoured by this species. It is noted that forestry as per Article 12 reporting is a threat/pressure of medium importance for this species.

No significant cumulative effects are predicted.

7.11.2.4 Short-eared Owl (National Importance)

The potential for developments at the wider landscape-level to result in significant cumulative or in-combination effects when assessed alongside the Proposed Lifetime Extension were considered. No significant effects were reported for this species in the data available from any of the wind farms located within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA). No significant effects were predicted to result from the Proposed Lifetime Extension.

The short-eared owl utilises similar habitats to hen harrier and as such is likely vulnerable to the similar negative effects of afforestation, agricultural intensification and the proliferation of turbines locally. However, owing to the very low population density in Ireland, the remaining available habitat is very unlikely to have reached its carrying capacity for short-eared owl. This limits the potential for significant cumulative habitat loss effects to result in the 10 years proposed for this extension of life application. There is 25,224ha of open habitat greater than 500m from a turbine in the SPA. This constitutes a significant amount of upland habitat. There is therefore likely no lack of habitat for the species within the SPA. Additionally, the Proposed Offsetting Plan , while designed specifically for hen harrier, is also likely to have auxiliary benefits for this species. In particular, deforestation will create open habitats that would be favoured by this species.

No significant cumulative effects are predicted.

7.11.2.5 Nightjar (National Importance)

The potential for developments at the wider landscape-level to result in significant cumulative or in-combination effects when assessed alongside the Proposed Lifetime Extension were considered. No significant effects were reported for nightjar in the data available from any of the wind farms located within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA). No significant residual effects were predicted to result from the Proposed Lifetime Extension.

The nightjar utilises similar habitats to hen harrier and as such is likely vulnerable to the similar negative effects of afforestation, agricultural intensification and the proliferation of turbines locally.

However, owing to the very low population density in Ireland, the remaining available habitat is very unlikely to have reached its carrying capacity for nightjar. This limits the potential for significant cumulative habitat loss effects to result in the 10 years proposed for this extension of life application. There is 25,224ha of open foraging habitat greater than 500m from a turbine in the SPA and abundant forestry for nesting. This constitutes a significant amount of upland habitat. There is therefore likely no lack of habitat for the species within the SPA. Additionally, the Proposed Offsetting Plan, while designed specifically for hen harrier, is also likely to have auxiliary benefits for this species. In particular, deforestation will create open habitats that would be favoured by this species for foraging.

No significant cumulative effects are predicted.

7.11.2.6 Kestrel (Local Importance)

Kestrel were recorded hunting within the Site and a probable breeding territory was identified adjacent to the Site during 2023 breeding season. The impacts of displacement and barrier effects as a result of the Proposed Lifetime Extension were assessed to be of Low effect significance. No significant effects of collision risk are anticipated at the county, national or international level.

The potential for developments at the wider landscape-level to result in significant cumulative or in-combination effects when assessed alongside the Proposed Lifetime Extensionwere considered. No significant effects were reported for kestrel in the data available from any of the wind farms located within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA).

The habitats within the Site comprise heath, commercial forestry and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape (see Section 7.11.1.2.2 above for overview of these wind farms). The habitats at the Site and these wind farms are not considered to be a scarce resource in the area. Kestrel were regularly recorded hunting within the Site and 500m radius during surveys and significant avoidance of the existing turbines was not evident (see Section 7.5.3.5). Kestrels have been found to only show low levels of turbine avoidance and are known to continue foraging activity close to turbines (Pearce-Higgins et al., 2009). It is likely that kestrel similarly utilise habitats within 500m of turbines of wind farms in the wider landscape. Furthermore, the existing Taurbeg turbine layout represents <1% of the total area within the SPA. Additionally, it is noted that the Proposed Offsetting Measures will result in the creation of habitats that would benefit kestrels also.

Therefore, significant cumulative impacts are not predicted. The potential for other developments to have resulted in significant cumulative or in combination effects when assessed alongside the Proposed Lifetime Extension was considered. Taking into consideration the reported effects at other wind farms and the predicted effects of the Proposed Lifetime Extension, no significant residual additive, antagonistic or synergistic effects have been identified.

Significant cumulative effects are not predicted.

7.11.2.7 Red Grouse (County Importance)

Red grouse favours the open habitats of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. There is 25,224ha of open habitat greater than 500m from a turbine in the SPA. This constitutes a significant amount of upland habitat.

The potential for developments at the wider landscape-level to result in significant cumulative or in-combination effects when assessed alongside the Proposed Lifetime Extensionwere considered. No significant effects were reported for red grouse in the data available from any of the wind farms located within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount

Eagle SPA). No residual significant effects were predicted to result from the Proposed Lifetime Extension.

A review of monitoring data from wind farms in upland habitats in the UK showed that while red grouse densities at wind farm sites reduced during construction, densities recovered by the first year after construction, indicating minimal displacement effects (Pearce-Higgins *et al.*, 2012). Significant cumulative effects are not predicted. Additionally, the Proposed Offsetting Plan, while designed specifically for for hen harrier, other species that share similar habitat requirements such as red grouse will also benefit. In particular, deforestation will create open habitats that would be favoured by this species.

No significant cumulative effects are predicted.

7.11.2.8 Wintering Snipe (Local Importance)

Snipe favours the open habitats of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. There is 25,224ha of open habitat greater than 500m from a turbine in the SPA. This constitutes a significant amount of upland habitat.

The potential for developments at the wider landscape-level to result in significant cumulative or in-combination effects when assessed alongside the Proposed Lifetime Extensionwere considered. No significant effects were reported for snipe in the data available from any of the wind farms located within the wider landscape (i.e. the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA). This species was recorded infrequently and in low numbers at the existing Taurbeg Wind Farm. No significant effects were predicted to result from the Proposed Lifetime Extension

The low rate of occurrence of this species in the surrounding uplands and within the existing Taurbeg Wind Farm limits the potential for significant cumulative effect. Wintering birds are typically more abundant in lowland areas. In addition, the Proposed Offsetting Plan provides for auxiliary and wider ecosystem gains. While the Proposed Offsetting Plan targets benefits specifically for hen harrier, other species that share similar habitat requirements such as snipe will also benefit. In particular, deforestation will create open habitats that would be favoured by this species.

No significant cumulative effects are predicted.

7.11.2.9 Buzzard (Local Importance)

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is made up of a mosaic of forestry and open habitats. This SPA includes vast areas of optimal habitat for this species, including approx. 48,500ha of habitat greater than 500m from a turbine. The habitats within the Site comprise heath, commercial forestry and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape (see Section 7.11.1.2.2 above for overview of these wind farms). The habitats at the Site and these wind farms are not considered to be a scarce resource in the area for buzzard. This and the favourable conservation status of the species limits the potential for significant cumulative effects to result.

No significant cumulative effects are predicted.

7.11.2.10 Sparrowhawk (Local Importance)

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA is made up of a mosaic of forestry and open habitats. This SPA includes vast areas of optimal habitat for this species, including approx. 48,500ha of habitat greater than 500m from a turbine. The habitats within the Site comprise heath, commercial forestry and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape

(see Section 7.11.1.2.2 above for overview of these wind farms). The habitats at the Site and these wind farms are not considered to be a scarce resource in the area for sparrowhawk. This and the favourable conservation status of the species limits the potential for significant cumulative effects to result.

No significant cumulative effects are predicted.

7.12 Conclusion

Following consideration of the residual effects (post-mitigation), it is concluded that the Proposed Lifetime Extension will not result in any significant effects on any of the identified KORs. No significant residual effects on receptors of International, National or County Importance were identified. Provided that the Proposed Lifetime Extension is operated and decommissioned in accordance with the design, best practice mitigation and offsetting measures that are described within this application, significant individual or cumulative effects on the identified KORs are not anticipated.

Planning and Environmental Consultants

LAND, SOILS AND GEOLOGY

Taurbeg Wind Farm Extension of Operational Life

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8. LAND SOILS AND GEOLOGY

8.1 Introduction

8.1.1 Background and Objectives

Hydro-Environmental Services (HES) was engaged by MKO Ireland (MKO) to carry out an assessment of the potential likely and significant effects of the Proposed Project (Proposed Lifetime Extension for the existing Taurbeg Wind Farm and Proposed Offsetting Measures) on the Land, Soils and Geology aspects of the receiving environment.

Details of the Proposed Project are described in full in Chapter 4 of this Environmental Impact Assessment Report (EIAR).

In summary, planning permission is sought for the continued operation of the existing Taurbeg Wind Farm as permitted by Cork County Council (Pl Ref No: 02/3608) for a further period of 10 years from the date of the expiry of the current planning permission (2026) as per Condition No. 7 of the existing consent. The existing Taurbeg Wind Farm comprises of 11 no. turbines. The grid connection does not form part of the Proposed Lifetime Extension but is assessed cumulatively.

This chapter provides a baseline assessment of the environmental setting of the existing Taurbeg Wind Farm (i.e. the Site) and the Proposed Offsetting lands, in terms of land, soils and geology and discusses the potential likely significant effects that the Proposed Project will have. Where required, appropriate mitigation measures to avoid any identified significant effects to land, soils and geology (i.e. natural resources) are recommended and the residual effects of the Proposed Project post-mitigation are assessed.

As detailed in Section 1.1.1 of the EIAR, this chapter uses for the following terminology: 'Proposed Lifetime Extension', 'the Site', the 'Proposed Offsetting Measures', 'Proposed Offsetting Lands' and the 'Proposed Project'.

8.1.2 Statement of Authority

Hydro-Environmental Services (HES) are a specialist geological, hydrological, hydrogeological and environmental practice which delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

Our core areas of expertise and experience includes soils, subsoils and geology. We routinely complete impact assessments for land, soils and geology, hydrology and hydrogeology for a large variety of project types including wind farms and renewable energy projects.

This chapter of the EIAR was prepared by Michael Gill and Conor McGettigan.

Michael Gill P.Geo (BA, BAI, Dip Geol., MSc, MIEI) is a Civil/Environmental Engineer and Hydrogeologist with over 22 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms and renewable projects in Ireland. In addition, he has substantial experience in geological characterisation, peatland morphology, and surface water drainage design and SUDs design and surface water/groundwater interactions. Michael has worked on the EIS/EIAR for Oweninny WF, Cloncreen WF, Derrinlough WF and over 100 other wind farm related projects across the country including the lifetime extension application for Booltiagh Wind Farm.

Conor McGettigan (BSc, MSc) is an Environmental Geoscientist with over 4 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor routinely prepares the land, soils and geology chapters of environmental impact assessment reports for wind farm development on peatlands.

8.1.3 Relevant Guidance

The Land, Soils and Geology chapter of this EIAR was prepared in accordance with, where relevant, the guidance contained in the following documents:

- Environmental Protection Agency (2022): Guidelines on the Information to be contained in Environmental Impact Assessment Reports;
- Institute of Geologists Ireland (2013): Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements;
- National Roads Authority (2008): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, 2018); and,

- Guidance on the preparation of the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU), (European Commission 2017).

8.2 Assessment Methodology

8.2.1 Desk Study

A desk study of the Site and Proposed Offsetting lands was completed in January and February 2024 to collect all relevant geological data for the above. The desk study was completed to supplement site walkover surveys and previous site investigation data. The desk study information has been checked and updated, where necessary, in January and February 2025.

The desk study included consultation with the following data sources:

- Environmental Protection Agency database (**www.epa.ie**);
- Geological Survey of Ireland - Groundwater and Geology Databases (**www.gsi.ie**);
- Geological Survey of Ireland – Geological Heritage site mapping (**www.gsi.ie**);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 21 (Geology of Kerry - Cork). Geological Survey of Ireland (GSI, 1996);
- Geological Survey of Ireland – 1:25,000 Field Mapping Sheets;
- General Soil Map of Ireland 2nd edition (**www.epa.ie**); and,
- Aerial Photography, 1:5000, and 6" base mapping.

The following documents relating to the Taurbeg Wind Farm were also reviewed and are referenced as required in this chapter:

- Whiteford Geoservices Ltd, 2004. Ground Investigation for Proposed Wind Farm Site at Taurbeg, Rockchapel, Co. Cork (Report No. 386/04) (refer to Appendix 8-2); and,
- Environmental Impact Statement for the existing Taurbeg Wind Farm Pl. Reg. Ref: N/02/3608 (2002).

8.2.2 Baseline Monitoring and Site Investigations

Site walkover surveys, including geological mapping, of the Site was undertaken by Conor McGettigan of HES (refer to Section 8.1.2 above for qualifications and experience) on 26th March and 14th August 2024. During these site visits observations were made on near surface geological features, accessible

bedrock was mapped and peat probing investigations were completed by HES within the Site. Additional walkover surveys and site investigations of the Proposed Offsetting lands were completed by GDG in October 2024.

Recent site investigations to address the Land, Soils and Geology Section of the EIAR included the following:

- HES completed site walkover surveys and geological mapping of bedrock outcrops at the Site on 26th March and 14th August 2024;
- A total of 10 no. gouge core sample points were undertaken by HES on 14th August 2024 across the site to investigate peat and underlying mineral soil lithology;
- Logging of subsoil exposures across the Site where mineral soils and peat profiles are exposed;
- Mineral subsoils and peat were logged according to BS: 5930 and Von Post Scale respectively;
- GDG completed site investigations at the Proposed Offsetting lands and the surrounding area in October 2024. In total 214 no. peat probes (107 no. within the Proposed Offsetting lands) and 16 no. shear vane tests (4 no. within the Proposed Offsetting lands) were completed.
- GDG completed a Peat Stability Risk Assessment for the Proposed Offsetting lands which is included as Appendix 8-1.

HES also completed a detailed review of the previous planning applications, associated planning files and site investigations prior to completing site investigations for the current application. Historic ground investigations have been completed at the Site undertaken by Whiteford Geoservices Ltd (June, 2004) as part of the pre-construction site investigation works for the existing Taurbeg Wind Farm (Pl. Reg. Ref: N/02/3608). This data was used to supplement the recent site investigations detailed above. A copy of the site investigation report is included as Appendix 8-2. These historic site investigations comprised:

- The excavation of 13 no. trial pits;
- The drilling of 2 no. boreholes;
- In situ California Bearing Ratio (CBR) testing;
- Ground resistivity testing (geophysical surveys) at turbine locations and the substation location; and,
- Laboratory testing of recovered soils samples for pH & sulphate.

8.2.3 Scope and Consultation

The scope for this EIAR has been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties. This consultation process is outlined in Section 2.9 of this EIAR.

The Geological Survey of Ireland were the only consultees to respond with respect to the Land, Soils and Geological environment. Their responses are summarised in Table 8-1. The GSI response was informative in nature with regard sources of online data for baseline assessment purposes.

Table 8-1: Summary of Scoping Responses

Consultee	Description	Addressed in Section
GSI	The GSI encouraged the use of their various geological datasets when conducting the EIAR.	The publicly available GSI databases were used during the preparation of this chapter as detailed in Section 8.2.1. Nearby geological heritage sites are described in Section 8.3.7.

Consultee	Description	Addressed in Section
	The GSI note that there are no county geological sites in the vicinity of the proposed wind farm extension. The GSI recommends that geohazards are taken into consideration and note that the Landslide Susceptibility Viewer indicates areas of Moderately High to High Susceptibility in the vicinity of the wind farm area. The GSI recommend the use of the Aggregate Potential Mapping viewer to identify areas of High to Very High source aggregate potential.	Geohazards and peat stability are considered in 8.3.9. The aggregate potential is described in Section 8.3.6.

8.2.4 Impact Assessment Methodology

Using information from the desk study and data from the site investigations, an assessment of the importance of the land, soil and geological environment within the Site is assessed using the criteria set out in Table 8-2 (NRA, 2008).

Table 8-2 Estimation of Importance of Soil and Geology Criteria (NRA, 2008).

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying the site is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying site is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site). Well drained and/or highly fertility soils. Moderately sized existing quarry or pit Marginally economic extractable mineral resource.

Importance	Criteria	Typical Example
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying site is moderate on a local scale.	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed Wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral Resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying site is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral Resource.

The assessment of effects follows the description of the baseline environment and is Stage 6 of 7 of the information which must be included in an EIAR (EPA, 2022). The guideline criteria for the assessment of effects states that the purpose of an EIAR is to identify, describe and present an assessment of the likely significant effects. The likely effects are described with respect to their quality (positive, neutral or negative), significance (imperceptible to profound), extent (i.e. size of area or number of sites effected), context (is the effect unique of being increasingly experienced), probability (likely or unlikely), duration (momentary to permanent), frequency and reversibility. The descriptors used in this environmental impact assessment are those set out in the EPA (2022) glossary of effects as shown in Chapter 1 of this EIAR.

In order to provide an understanding of this descriptive system in terms of the geological/hydrological environment, elements of this system of description of effects are related to examples of potential likely significant effects on the geology and morphology of the existing environment, as listed in Table 8-3.

Table 8-3: Impact descriptors related to the receiving environment.

Impact Characteristics		Potential Hydrological Impacts
Quality	Significance	
Negative only	Profound	Widespread permanent impact on: › The extent or morphology of a cSAC. › Regionally important aquifers. › Extents of floodplains. Mitigation measures are unlikely to remove such impacts.
Positive or Negative	Significant	Local or widespread time-dependent impacts on: › The extent or morphology of a cSAC / ecologically important area.

Impact Characteristics		Potential Hydrological Impacts
Quality	Significance	
		› A regionally important hydrogeological feature (or widespread effects to minor hydrogeological features). › Extent of floodplains. Widespread permanent impacts on the extent or morphology of an NHA/ecologically important area. Mitigation measures (to design) will reduce but not completely remove the impact – residual impacts will occur.
Positive or Negative	Moderate	Local time-dependent impacts on: The extent or morphology of a cSAC / NHA / ecologically important area. › A minor hydrogeological feature. › Extent of floodplains. Mitigation measures can mitigate the impact OR residual impacts occur, but these are consistent with existing or emerging trends
Positive, Negative or Neutral	Slight	Local perceptible time-dependent impacts not requiring mitigation.
Neutral	Imperceptible	No impacts, or impacts which are beneath levels of perception, within normal bounds of variation, or within the bounds of measurement or forecasting error.

8.2.5 Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation of the Land, Soils and Geology Chapter of the EIAR.

8.2.6 Study Area

The study area for the land, soils and geological environment is limited to the Site, which relates to the primary study area for the Proposed Lifetime Extension of Taurbeg Wind Farm, as delineated by the EIAR Site Boundary, and the Proposed Offsetting lands located in Coom and Knockatee, Co. Kerry.

There is no potential for the Proposed Project to affect the land, soils and geological environment outside of the study area.

8.3 Existing Environment

8.3.1 Site Description and Topography

8.3.1.1 Taurbeg Wind Farm

The Site is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork. The Site is located in the townlands of Taurbeg, Glasheenanargid and Taurmore. The Site has a total area of ~112hectares (ha).

The Site is located in an upland setting and is situated on the southern foothills of the Mullaghareirk Mountain range. Topography within the Site ranges from ~302 metres above Ordnance Datum (mOD) in the northeast to ~405mOD in the southwest. The lowest elevations are found in the northeast of the Site, at the existing entrance to Taurbeg Wind Farm. Topography rises to the west and there are three local peaks within the Site, one standing at an elevation of ~392mOD in the north, with two local peaks standing at ~405mOD further south.

The Site is drained by several streams which ultimately drain to the Feale or Blackwater rivers. The Site comprises of a mixture of renewable energy production, coniferous forestry, peat bogs and transitional woodland scrub.

The existing Taurbeg Wind Farm is accessed via the wind farm site entrance off the L5005 local road, in the townland of Taurbeg and is served by a network of existing wind farm access roads.

8.3.1.1.1 *Existing Infrastructure*

The existing development footprint of Taurbeg Wind Farm is ~3.76ha, representing ~3% of the Site (~112ha).

Taurbeg Wind Farm comprises of 11 no. existing wind turbines, with an estimated installed capacity of 25.3 Megawatt (MW). The total footprint of the turbines and their associated hardstands is ~3,891m^2. The turbine base elevations range from 330mOD (T7) to 401mOD (T11). Each wind turbine is secured to a reinforced concrete foundation. No piled foundations have been installed at the Site. The existing foundations are circular in plan with an average area of 100m^2. The existing hardstand areas around each turbine comprise of levelled and compacted hardcore. The existing hardstand areas vary slightly at each of the 11 no. turbines, with an average area of 722m^2.

During the initial construction of the existing wind farm, existing tracks were upgraded, and new access roads were constructed to provide access within the Site and to connect wind turbines and associated infrastructure. Site roads were constructed of consolidated gravel with an average running width of 5.5m and a total length of 8.4km. The current footprint of the existing roads at the Site is 32,230m^2.

Each turbine is connected to the on-site electricity substation through underground medium voltage (MV) electricity and communications cabling. Multicore fibre-optic cabling connects each wind turbine to the wind farm control building. The electricity and fibre-optic cabling run in trenches below the ground surface, along the sides of or underneath the internal roadways. The routes of the cabling ducts follow the access tracks to each turbine location.

The existing substation compound measures ~1,428m^2. A 38kV underground cable runs between the onsite substation and a mast at the south of the Site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation.

There are no changes proposed to the existing Taurbeg Wind Farm infrastructure or grid connection as part of the Proposed Lifetime Extension.

8.3.1.2 Proposed Offsetting Measures

The Proposed Offsetting lands are located in townlands of Coom and Knockatee, Co. Kerry, ~12km west/southwest of the existing Taurbeg Wind Farm. The Proposed Offsetting lands consist of 4 no. parcels of land proposed for hen harrier habitat creation, 3 in the townland of Coom (Areas 1, 2 and 4) and 1 no. further north in the townland of Knockatee (Area 3).

The Proposed Offsetting lands are located on the slopes of Mount Eagle which stands at an elevation of 431mOD. Topography within the Proposed Offsetting lands is steeply sloping and ranges from ~200 to ~380mOD.

The Proposed Offsetting lands are located in an area dominated by coniferous forestry plantations. The northwestern Proposed Offsetting lands (~17.7ha) (Area 3) are located in an agricultural field whilst the remaining lands (~105.5ha) are located in coniferous forestry plantations (Areas 1, 2 and 4).

8.3.2 Land and Land Use

8.3.2.1 Taurbeg Wind Farm

Based on Corine land cover mapping (2018) the Site comprises of “peat bogs” with some areas of “transitional woodland scrub” to the north and “coniferous forestry” to the south. Land use in the wider surrounding area comprises primarily of “transitional woodland scrub” and “agricultural pastures” with some pockets of “coniferous forestry”. No significant land use changes have been recorded by historic Corine mapping (1990 - 2018).

The Taurbeg Wind Farm has been operational since March 2006. In terms of the existing Taurbeg Wind Farm infrastructure, all 11 no. turbines and the existing substation are mapped by Corine (2018) on peat bogs.

Site walkover surveys and the inspection of recent aerial photographs, completed by HES, have verified land use at the Site. These surveys confirmed that the Site is located in an upland area which is dominated by peat bogs, agricultural pastures, coniferous forestry, transitional woodland scrub and renewable energy production.

8.3.2.2 Proposed Offsetting Measures

The northern Proposed Offsetting lands, located in the townland of Knockatee, are mapped by Corine (2018) to be located in agricultural pastures (Area 3). The other 3 no. Proposed Offsetting lands are mapped in areas of transitional woodland scrub (Areas 1, 2 and 4).

Landcover in the surrounding land is mapped by Corine as peat bogs, moors and heathlands and coniferous forestry.

Landcover at the Proposed Offsetting lands has been verified by inspection of recent aerial imagery and site walkover surveys completed by GDG in October 2024. The walkover surveys confirmed that the Proposed Offsetting lands (with the exception of Area 3) comprised of extensive areas of upland blanket peat, much of which is afforested.

8.3.3 Peat/Soils and Subsoils

8.3.3.1 Taurbeg Wind Farm

The published Teagasc soils map (www.gsi.ie) for the area shows that the Site is predominantly overlain by blanket peat. Some areas of peaty poorly drained, mainly acidic mineral soils (AminPDPT) and

acidic poorly drained mineral soils (AminDW) are mapped around the periphery of the Site. Meanwhile, shallow, rocky, peaty/non-peaty mineral complexes (AminSPRT) are mapped in the valley of a stream to the south of T7. In terms of the existing Taurbeg Wind Farm infrastructure, 10 no. turbines and the existing onsite substation are mapped in areas of blanket peat whilst T6 is mapped in an area of acidic poorly drained mineral soils.

Similarly, the GSI subsoil mapping (www.gsi.ie) shows that blanket peat is the dominant subsoil type at the Site. Some tills derived from Namurian sandstones and shales are mapped around the periphery of the Site. Meanwhile, an area of bedrock outcrop or subcrop is mapped along a natural watercourse to the south of T7. In terms of the existing Taurbeg Wind Farm infrastructure, 10 no. turbines and the existing onsite substation are mapped in areas underlain by blanket peat. T6 is mapped to be underlain by till derived from Namurian sandstones and shales.

Subsoils mapped in the surrounding lands are the same as those mapped within the Site with alluvium deposits also mapped along several local watercourses.

A subsoil geology map for the Site is shown as Figure 8-1 below.

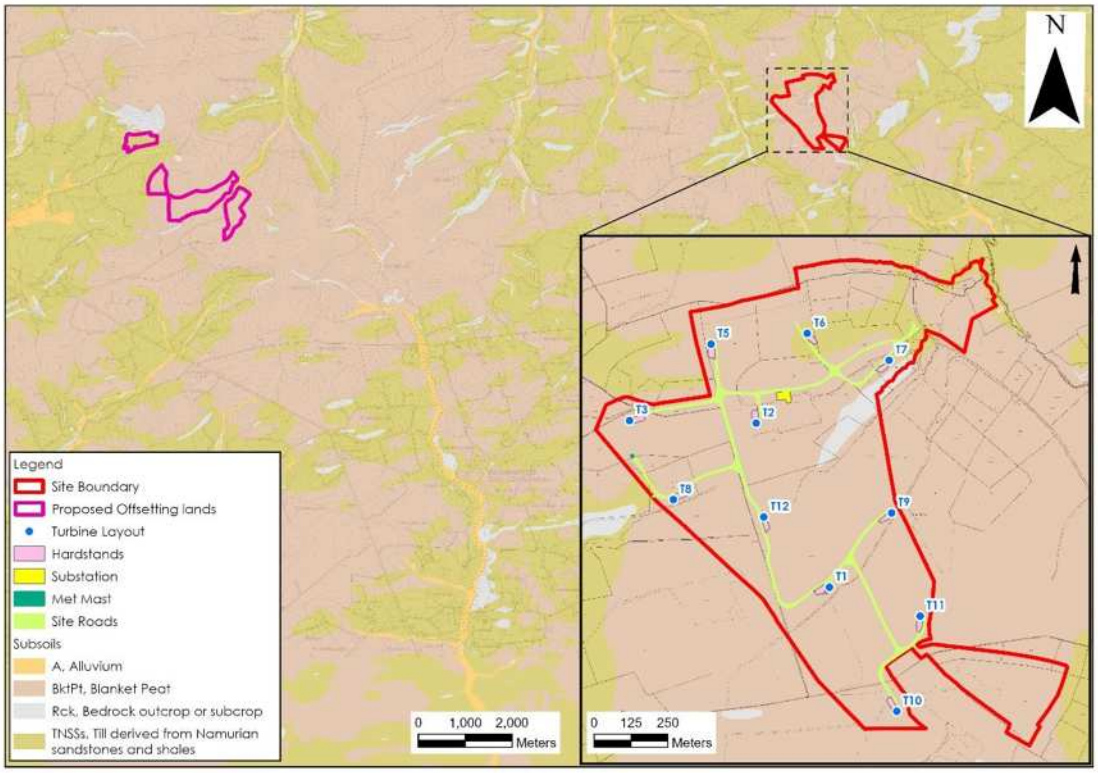

Figure 8-1: Subsoils Map (www.gsi.ie)

The soils and subsoils present at the Site have been confirmed by recent and historic site investigations comprising of gouge cores, boreholes and trial pits.

Whiteford Geoservices Ltd (June 2004) completed a programme of site investigations during the pre-construction phase of Taurbeg Wind Farm (Appendix 8-2). These historic site investigations comprised of the excavation of 13 no. trial pits (at the turbine locations (one of which, T4, was not constructed) and the substation location), the drilling of 2 no. boreholes (at T1 and T12) and laboratory testing of recovered soil samples. These historic site investigations found the typical stratigraphy of the existing Taurbeg Wind Farm Site to be as follows:

- The site is overlain by PEAT which ranges in thickness from 0.2 to 2.5m;

- The peat depth in the 13 no. trial pits ranged from 0.2 to 1.7mbgl (metres below ground level) whilst BH1 completed at T1 recorded a peat depth of 2.5m;
- The peat is typically underlain by a light brown CLAY which was often noted to be sandy. These clay deposits ranged in thickness from 0.3 to 1.0m;
- The sandy clay is typically underlain by a medium dense coarse GRAVEL or gravelly CLAY; and,
- The full thickness of the soil/subsoil profile ranged from 0.86 to 5.1m at which depths weathered bedrock was encountered.

HES verified the nature of the soils and subsoils at the Site through the completion of gouge cores (10 no.) and the logging of soil/subsoil exposures. During these site investigations, no peat was encountered at T7 on the lower ground in the east of the Site. A gouge core completed in the vicinity of T7 encountered brown silty clayey soils. Where present the peat depths across the Site range from 0.1 to 1.8m. The peat is typically shallow with only 2 no. gouge cores encountering peat depths in excess of 0.5m. 1.65m of peat was encountered near T8 whilst 1.8m of peat was encountered near T12. The gouge cores typically encountered an orange-brown gravelly clay beneath the peat.

The locations of the recent and historic site investigation points are shown in Figure 8-2.

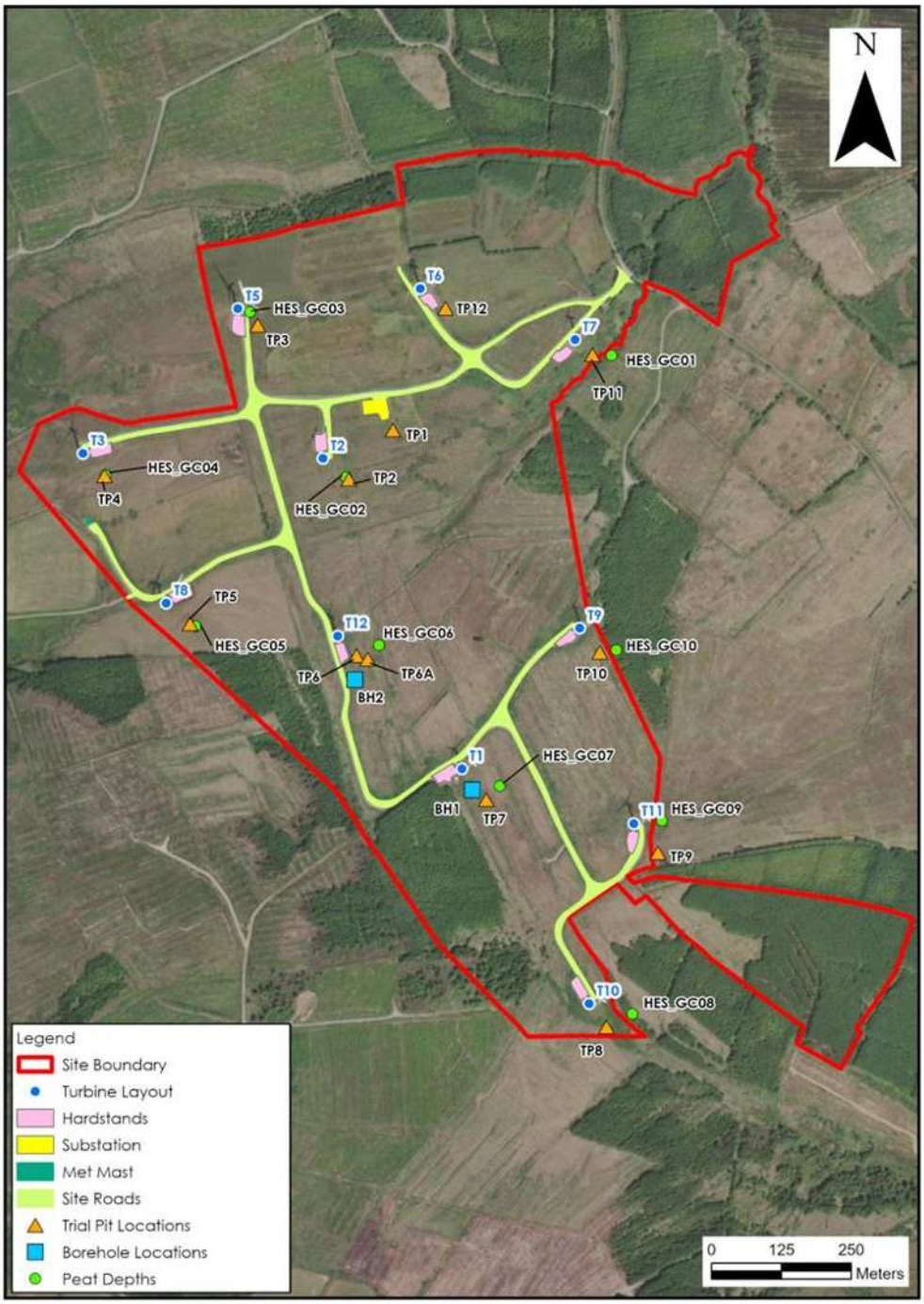

Figure 8-2: Site Investigation Map (Taurbeg Wind Farm)

8.3.3.2 Proposed Offsetting Measures

The published Teagasc soils map (www.gsi.ie) shows that Proposed Offsetting areas 1 and 4 are overlain entirely by blanket peat. Meanwhile, peaty poorly drained mineral soils (AminPDPT) and mineral alluvium are mapped along a stream between Area 1 and Area 4. Area 2 is overlain predominantly by blanket peat with some acid deep well drained mineral soils (AminDW) and acid poorly drained mineral soils (AminPD) mapped along the western perimeter of Area 2. No peat is mapped in the vicinity of Area 3 with the mapped soils in this area comprising of acidic deep well drained mineral soils (AminDW), acidic poorly drained mineral soils (AminPD) and acidic shallow well drained mineral soils (AminSW).

The GSI subsoil map (www.gsi.ie) shows that the Proposed Offsetting areas 1 and 4 are underlain by blanket peat. A small area of alluvium and tills derived from Namurian sandstones and shales is mapped between Area 1 and Area 4. Area 2 is underlain predominantly by blanket peat with some tills in the west. Meanwhile, Area 3 is mapped to be underlain largely by tills derived from Namurian sandstones and shales with some bedrock outcrop or subcrop mapped in the northwest.

Site walkover surveys and peat probing were completed by GDG in October 2024 in areas 1, 2 and 4. The initial surveys targeted a larger area of the Proposed Offsetting lands and included a total of 214 no. peat probes, 107 of which are located within the final chosen Proposed Offsetting lands. Peat thicknesses within the Proposed Offsetting lands ranged from 0 to 3.2m with a median value of 1.6m. 23% of the recorded peat depths within the Proposed Offsetting lands were less than 1m and 72% were less than 2m.

The locations of the peat probes with respect to the Proposed Offsetting lands are shown in Figure L-2 of Appendix 8-1 (Peat Stability Risk Assessment Report).

8.3.4 Bedrock Geology

8.3.4.1 Taurbeg Wind Farm

Based on the GSI bedrock mapping (www.gsi.ie) the Site is underlain by 2 no. bedrock geological formations. The northern section of the Site is underlain by the Glenoween Shale Formation which is comprised of grey silty mudstones. Meanwhile, the south of the Site is underlain by the Cloone Flagstone Formation which is composed of greywackes, siltstones and silty mudstones. In terms of the existing Taurbeg Wind Farm infrastructure, a total of 9 no. turbines and the onsite substation are mapped to be underlain by the Glenoween Shale Formation. Meanwhile, T10 and T11 are mapped to be underlain by the Cloone Flagstone Formation.

There is 1 no. large southwest to northeast orientated fault mapped within the Site. This fault is mapped ~700m from the closest existing turbine (T11). The GSI also map the presence of an anticlinal fold axis in the south of the Site, also trending in a southwest to northeast direction. The GSI do not map any bedrock outcrops within the Site.

A bedrock geology map is shown as Figure 8-3 below.

The trial pits completed by Whiteford Geoservices (2004) as part of the original baseline assessment found that the depth to weathered sandstone and mudstone bedrock at the turbine and substation locations ranged from 0.86 to 2.9m. No weathered rock was encountered in 3 no. trial pits completed at T1 and T12. However, the boreholes completed at these locations encountered rock at depths of 4.0m (T12) to 5.1m (T1).

These previous site investigations typically describe the bedrock at the Site as comprising of dark grey, laminated mudstone and siltstone and yellowish or red thinly bedded to massive sandstones.

During the site walkover surveys completed by HES, bedrock outcrops were recorded in several of the streams draining the Site and was consistent with the description provided by the GSI and that encountered during the previous site investigation works.

8.3.4.2 Proposed Offsetting Measures

The vast majority of the Proposed Offsetting lands are mapped by the GSI to be underlain by the Glenoween Shale Formation. Meanwhile, the Cloone Flagstone Formation is mapped to underlie the western section of the northern Proposed Offsetting lands in the townland of Knockatee (Area 3). The Cloone Flagstone Formation is noted to comprise of greywacke, siltstone and silty shale.

There is 1 no. large east/northeast to west/southwest orientated fault to underlie the southern section of the Proposed Offsetting lands. The GSI map several areas of bedrock outcrop near the summit of Mount Eagle.

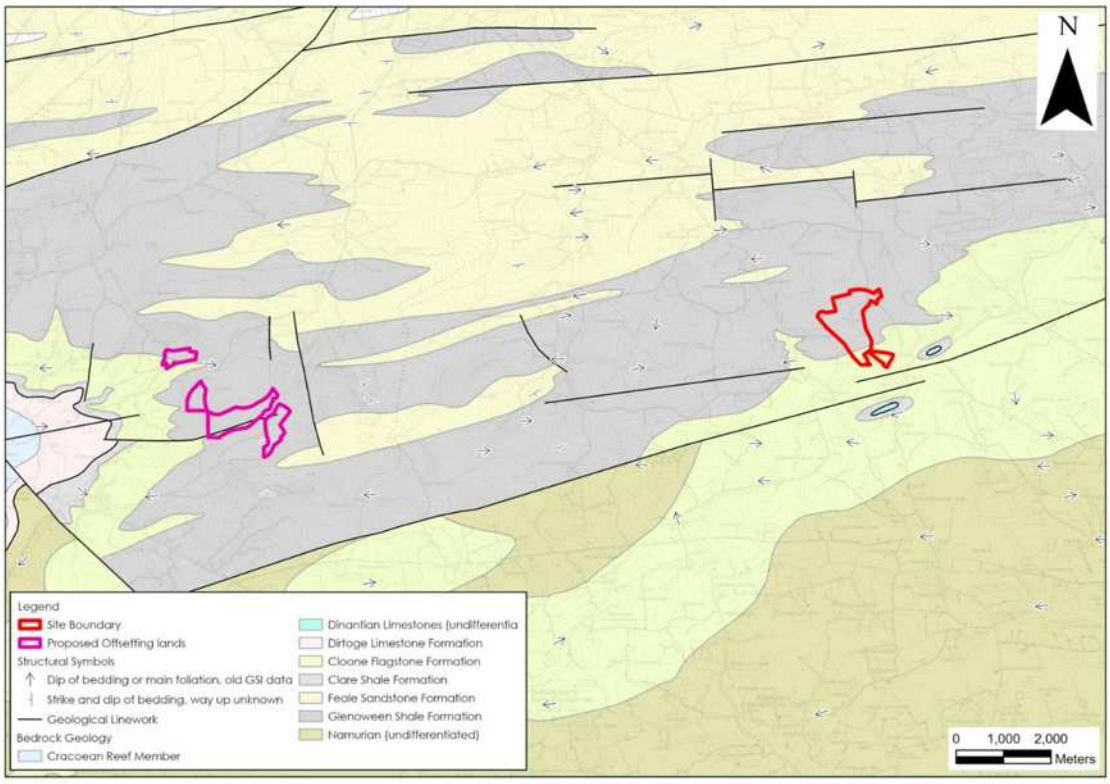

Figure 8-3: Bedrock Geology Map (www.gsi.ie)

8.3.5 Geological Resource Importance

8.3.5.1 Taurbeg Wind Farm

The GSI Online Database accessed via the Public Data Viewer (www.gsi.ie) does not record the presence of any active bedrock quarries or sand and gravel pits within the Site or in the surrounding lands. The closest mapped active quarry is located at to the southwest of Ballydesmond village, ~10km southwest of the Site. Furthermore, the GSI do not record the presence of any historic quarries or pits within the Site.

A borrow pit was used to win stone for access tracks associated with the construction of the Taurbeg Wind Farm. This borrow pit was located towards the north of the site and was permitted under planning reference 05/602. This borrow pit which facilitated the construction of the wind farm has been restored.

The GSI do not record any mineral localities within the Wind Farm Site or in the surrounding lands. Coal is noted to be present in the townland of Knockawinna, ~6.6km to the northwest of the Site.

The GSI online Aggregate Potential Mapping Database (www.gsi.ie) shows that the crushed rock aggregate potential of the Site ranges from 'Very Low' to 'High'. The vast majority of the site is mapped as having 'Very Low' potential for rock extraction with only very small, localised areas of 'High' potential. The bedrock at the Site could be used on a "sub-economic" local scale for construction purposes.

The Site is not mapped in an area of granular aggregate potential (i.e. potential for gravel reserves). There are some localised areas of 'Very Low' potential in the surrounding lands, along local watercourses. The peat and subsoil deposits at the Site can be considered to be of 'Low' importance as the peat is not designated in this area.

8.3.5.2 Proposed Offsetting Measures

There are no active quarries or sand and gravel mapped by the GSI in the immediate vicinity of the Proposed Offsetting lands. The closest mapped bedrock quarry is located ~2.4km northwest of the Proposed Offsetting lands.

The GSI do not record any mineral localities in the local area. The closest mapped mineral locality is ~3.1km to the west, where an old quarry is mapped in the townland of Kilquane.

The GSI online Aggregate Potential Mapping Database (www.gsi.ie) shows that the crushed rock aggregate potential of the Proposed Offsetting lands ranges from 'Very Low' to 'Moderate'. Bedrock has not been extracted in this area due to the presence of the overlying peat deposits.

Furthermore, the Proposed Offsetting lands are not mapped in an areas of granular aggregate potential. The peat and subsoils can be considered to be of low importance, and they have been degraded by the forestry plantations in this area.

8.3.6 Geological Heritage Sites and Designated Sites

8.3.6.1 Taurbeg Wind Farm

There are no recorded geological heritage sites within the Site (www.gsi.ie).

The closest geological heritage sites include:

- Ballinatona, Meelin Spring County Geological Site (CGS) (Site Code: CK003). This CGS is described as a warm spring and a groundwater supply source and is located ~5km to the east of the Site;
- Trinity Well CGS (Site Code: CK085) is described as a warm spring with religious association. This CGS is located to the west of Newmarket and ~7.65km southeast of the Site; and,
- Owentaraglin River CGS (CK070) comprises of a number of tight meanders along the course of the Owentaraglin River, south of Kishkeam. This CGs is situated ~7.5km to the southwest.

There are no other geological heritage sites within 10km of the Site.

A map of local geological heritage sites is shown below as Figure 8-4.

The Site is mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protected Area (SPA) (Site Code: 004161).

8.3.6.2 Proposed Offsetting Measures

There are no recorded geological heritage sites within the Proposed Offsetting lands.

The closest audited geological heritage site is the Owentaraglin River CGS (Site Code: CK070). This site comprises of a number of tight meanders along the course of the Owentaraglin River, located ~11.6km to the southwest.

There are 3 no. unaudited geological sites to the west of the Proposed Offsetting lands. These include:

- Ballynahallia Quarry Cave, which is recommended for Geological NHA, is located ~5.3km to the southwest.
- Tobermaing CGS, which contains a karst spring, is located ~6.4km to the west; and,
- Crag Cave, which is recommended for Geological NHA, located ~6.1km to the west.

Furthermore, the Proposed Offsetting lands are also mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protected Area SPA. This SPA is a very large site centred on the borders between Cork, Kerry and Limerick. The SPA consists of a variety of upland habitats, though almost half is afforested (NPWS, 2015). The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier. It is a conservation objective to restore the extent and quality of both open heath and bog habitats within the SPA as these habitats can provide important nesting and foraging resources.

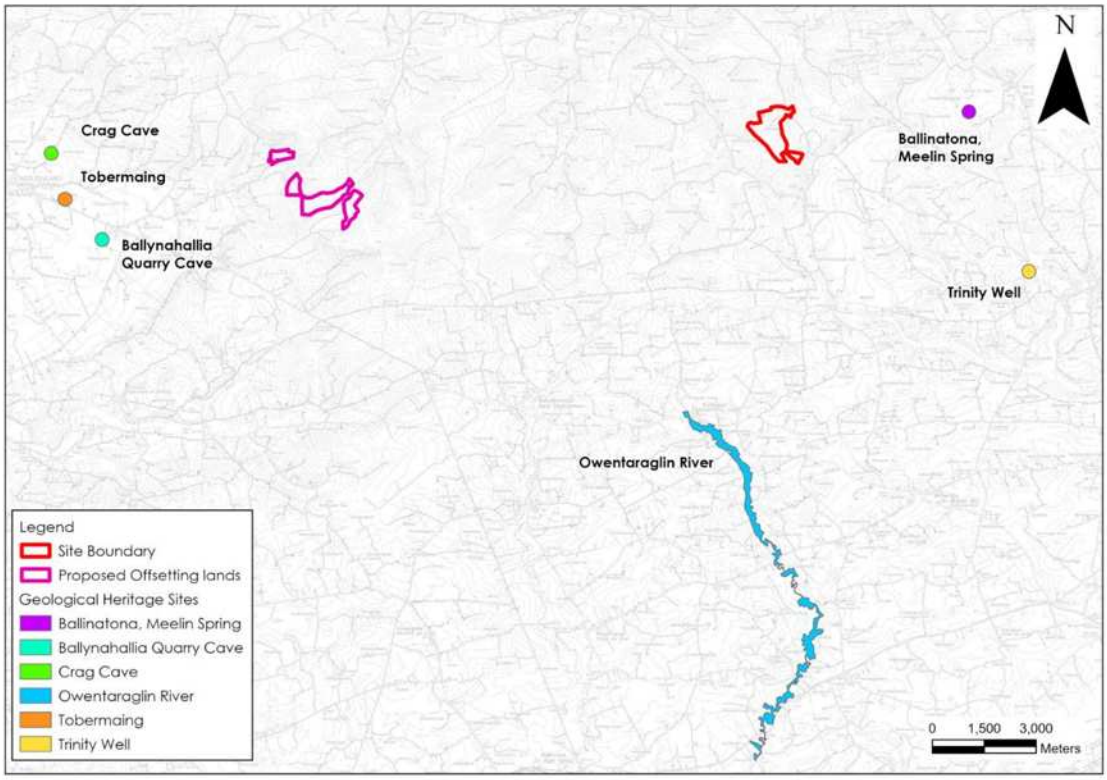

Figure 8-4: Geological Heritage Sites (www.gsi.ie)

8.3.7 Soil Contamination

8.3.7.1 Taurbeg Wind Farm

There are no known areas of soil contamination within the Site. During the site walkovers and site investigations, no areas of contamination concern were identified. No historic borrow pits which may have contaminated tailings were identified within the Site.

According to the EPA online mapping (www.epa.ie), there are no licensed waste facilities or dump sites located within the Site. The are no EPA mapped waste facilities within 10km of the Site.

8.3.7.2 Proposed Offsetting Measures

There are no known areas of soil contamination in the vicinity of the Proposed Offsetting lands.

8.3.8 Peat Stability

8.3.8.1 Taurbeg Wind Farm

The GSI do not record the occurrence of any historic landslides within the Site (www.gsi.ie). The closest recorded landslide is located ~11km to the west. This event dates from November 2020 and is described as a peat slide which occurred in an area of mixed forestry at Knockfeha, Co. Kerry. A historic landslide is also mapped ~12km to the southeast of the Site. This landslide near Kanturk dates from 1839 and is described as a peat slide which occurred in a blanket bog in which the peat was over 10ft thick.

The GSI Landslide Susceptibility Map (www.gsi.ie) classifies the probability of a landslide occurring. The landslide susceptibility of the Wind Farm Site was classified by the GSI (2023) as ranging from "low" to "high". The areas of susceptibility are localised, with the majority of the Site having "low" to "moderately low" landslide susceptibility.

There will be no construction activities associated with the Proposed Lifetime Extension, and therefore no peat stability assessment has been carried out at the Site.

The original EIAR found that the existing Taurbeg Wind Farm was suitable from a peat stability perspective, and the existing wind farm was constructed without any peat stability issues. The main risk related to the construction work activities and earthworks are associated with the construction of the wind farm. The risks are significantly lower for an operational wind farm.

There have been no reported occurrences of ground instability or peat slides during the both the construction and operational phase of the Taurbeg Wind Farm.

Furthermore, walkover surveys at the Site, completed by HES in 2024, did not record any signs of peat instability. The survey consisted of a visual inspection of the existing infrastructure and drainage on site. The assessment found that the Site is, in general, in good condition with little or no rutting on access roads and adequate drainage provided. The site infrastructure in general appears to be founded on natural gravels below the level of the peat and clay upper layers. All turbine hardstandings were viewed and the interior road network was traversed by jeep as well as on foot. No signs of instability were recorded.

8.3.8.2 Proposed Offsetting Measures

8.3.8.2.1 *Introduction*

GDG completed a Peat Stability Risk Assessment Report (PSRA) (2025) for the Proposed Offsetting lands and is attached in Appendix 8-1.

The PSRA is restricted solely to the assessment of the Proposed Offsetting Measures. No peat is recorded in the northernmost Proposed Offsetting lands, which are currently comprised of agricultural pastures. The PSRA concentrates on the other 3 no. pockets of lands proposed for deforestation.

8.3.8.2.2 *Desk Study*

The GSI record a historic landslide immediately to the south of the Proposed Offsetting lands. This landslide event dates from 15th November 2020 and is described as a peat flow. Based on the inspection of recent aerial imagery, there appears to have been 2 no. peat slides in the lands to the southwest of the Proposed Offsetting lands (Area 4). The GSIs landslide susceptibility of the Proposed Offsetting lands was classified by the GSI (2023) as ranging from "low" to "high". The areas of high susceptibility are located on the western slopes of Mount Eagle.

8.3.8.2.3 Mount Eagle Bog Peat Slides

The PSRA states that 2 no. large peat slides have been identified as having occurred immediately adjacent to the Proposed Offsetting lands since 2012 (south of Area 4). The source zone associated with a pre-2019 peatslide, referred to in the PSRA as Mount Eagle – A, is located at a minimum distance of 150m east of the Proposed Offsetting lands, Meanwhile the source zone associated with Mount Eagle - B (peat slide dating from November 2020) is located 280m to the southeast. The Mount Eagle Bog Landslides have been assessed in detail by Fehily Timoney (FT) and the Geological Survey of Ireland (FT/GSI, 2024).

GDG completed detailed walkover surveys and peat probing in the areas of these historic peat slides. The PSRA concludes that the main conditioning factors which led to the peat slides included:

- The cutting of artificial drainage ditches parallel to topographic contours which may have resulted in localised surface water ponding, leading to increased lubrication and buoyancy at the base of the peat profile.
- Areas of extremely wet, saturated peat were recorded by GDG in the vicinity of the source zones with very low shear vane readings.
- The presence of a slight convex break in slope close to the assumed failure initiation points.
- The afforested and drained nature of the area is hypothesised to have contributed to disruption of the hydrological regime.
- Mount Eagle A is likely to have been instrumental in condition the failure of Mount Eagle B as it removed lateral and downslope support

GDG's walkover surveys also noted an area of significant peat scarps directly upslope of an area of extremely shallow peat 20-200m south of the Proposed Offsetting lands. Visible tension cracks were recorded on the scarps which are located in close proximity to a significant convex break in slope. GDG hypothesis that this area could represent an area of relic instability which pre-dates the afforestation. A second area with visible tension cracking was recorded ~260m south of the Proposed Offsetting lands and directly south of a firebreak. GDG state that this may represent the early stages of a peat failure.

8.3.8.2.4 Peat Stability Analysis and Assessment

An analysis of the risk of a peat slide occurring was carried out across the Proposed Offsetting lands.

The purpose of the analysis was to determine the Factor of Safety (FoS) of the peat slopes. The FoS is a numerical value of the stability on individual areas of a peatland. The FoS is calculated by a combination of geotechnical information and site characteristics which are obtained from desk study and site walkovers including the property of the peat, shear strength, depth, slope geometry underlying strata and groundwater etc. The factor of safety provides a direct measure of the degree of stability of a slope and is the ratio of the shear resistance over the downslope destabilising force. Provided the available shear resistance is greater than the downslope destabilising force then the factor of safety will be greater than 1.0 and the slope will remain stable. If the factor of safety is less than 1.0 the slope is unstable and liable to fail. The acceptable range for factor of safety is typically from 1.3 to 1.4. The minimum required Factor of Safety (FoS) is 1.3 based on BS6031:1981: Code of Practice for Earthworks (BSI, 2009). The assigned probability of instability associated with a given FoS value is described in Table 8-4 below.

Table 8-4: Factor of Safety Limits.

Factor of Safety (FoS)	Slope Stability
FoS≥1.3	Stable and safe

Factor of Safety (FoS)	Slope Stability
1≤FoS<1.3	Stable but not safe
FoS	Unstable

Stability of a peat slope is dependent on several factors working in combination. The main factors that influence peat stability are slope angle, shear strength of peat, depth of peat, pore water pressure and loading conditions.

An adverse combination of the factors mentioned in the preceding sentence could potentially result in peat sliding. An adverse condition of one of the above-mentioned factors alone is unlikely to result in peat failure. The infinite slope model (Skempton and DeLory, 1957) is used to combine these factors to determine a factor of safety for peat sliding. This model is based on a translational slide, which is a reasonable representation of the dominant mode of movement for peat failures.

To assess the factor of safety for a peat slide, an undrained[1] (short-term stability) and drained (long-term stability) analysis has been undertaken to determine the stability of the peat slopes on site.

The undrained loading condition applies in the short-term during the deforestation works and until works induced pore water pressures dissipate. A conservative value of 4kPA was adopted for the undrained shear strength across the Proposed Offsetting lands.

The drained loading condition applies in the long-term. The condition examines the effect of in particular, the change in groundwater level as a result of rainfall on the existing stability of the natural peat slopes.

The factors of safety obtained for the two different conditions (undrained and drained) and for the two surcharge scenarios (no surcharge and 10kPa of peat surcharge (equivalent to 1m of peat) are presented in both table format and map format in the PSRA and are summarised below. The FoS was calculated at each peat probe location and was completed semi-automatically in GIS for the areas between the peat probes.

Undrained Analysis

For the undrained condition almost all areas of the Proposed Offsetting lands have an FoS>1.3 and are considered to be stable and safe. Some small areas along the southeastern and southwestern boundaries of Area 1 and 4 have an FoS<1, with these risk areas being caused by locally steeper slopes close the edge of the forestry, where the topography dips towards the local watercourse and towards machine excavated firebreaks.

For the undrained condition with a surcharge of 10kPa, the vast majority of the Proposed Offsetting lands are considered to be stable and safe (FoS>1.3). However, there are some areas in the north of Area 2 and along the south and eastern boundaries of Areas 1 and 4 which have an FoS between 1-1.3 or <1. The low FoS in the north corresponds to an area where there is no peat, and is not considered to represent a true risk. The risk areas along the southern and eastern boundaries are caused by locally steep slopes.

Drained Analysis

[1] *For the stability analysis two load conditions were examined, namely*

Condition (1): *no surcharge loading*
Condition (2): *surcharge of 10 kPa, equivalent to 1 m of stockpiled peat assumed as a worst case.*

For the drained condition, almost all of the Proposed Offsetting lands are considered to be stable and safe, with only small areas on the southeastern and northern extremities of area 1 and 4 respectively (associated with local steep slopes in Areas 1 and 4) have an FoS<1.

Similarly, for the drained condition with a surcharge of 10kPA, only small areas along the on the southeastern and northern extremities of area 1 and 4 respectively of Areas 1 and 4 had FoS<1 with the vast majority of the lands returning FoS values >1.3.

8.3.8.2.5 *PSRA Conclusions*

The findings of the PSRA showed that the Proposed Offsetting lands predominantly have an acceptable margin of safety and are suitable for the Proposed Offsetting Measures. Some very localised areas are deemed to have a higher risk of instability due to local topography. It is considered that these areas do not present a significant peat slide risk if the mitigation measures outlined in Section 8 of the PSRA are implemented, and that the residual risk is manageable.

Based on the available data, the fieldwork, and GDG's professional judgement, it is concluded that significant peat slides are unlikely on the Proposed Offsetting lands with diligent peat management and careful consideration of the peat conditions at the Proposed Offsetting lands during the Proposed Offsetting Measures.

8.4 Receptor Sensitivity and Importance

Based on the criteria set out in Table 8-2 above, the peat and soils at the Site and at the Proposed Offsetting lands can be classed as being of low importance as the peat is not designated in these areas.

The bedrock geology underlying the Site and the Proposed Offsetting lands can be classed as being of medium importance where the bedrock could be used on a sub-economic scale.

The land, peat, soils and bedrock geological formations at the Site and at the Proposed Offsetting lands will be included in the impact assessment due to their proximal location to the Proposed Project and the potential direct effects that the Proposed Project may have on these receptors.

All geological heritage sites have been screened out of the impact assessment due to their distant location from the Site and the Proposed Offsetting lands. There is no potential for effects to occur on these geological heritage sites.

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protected Area SPA will be included in the impact assessment as the Site and the Proposed Offsetting lands are located within this designated site.

The peat stability at the Site and at the Proposed Offsetting lands will also be included in the land, soils and geological impact assessment.

8.5 Characteristics of the Proposed Project

Planning permission is being sought for the Proposed Lifetime Extension of Taurbeg Wind Farm as permitted by Cork County Council under planning regulation ref N/2002/3608, for a further period of 10 years from the date of expiry (2026) per Condition no. 7 of the original planning consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Project is described in full in Chapter 4 of this EIAR and relates to the extended operation of all elements of the existing wind farm and the Proposed Offsetting Measures for the purposes of hen harrier.

There are no alterations proposed to the existing wind farm infrastructure, therefore, there are no requirements for construction works or reinstatement works for the Proposed Lifetime Extension.

Typically, daily operational phase maintenance traffic will consist of four-wheel drive vehicles or vans with no off-road requirements.

During the Proposed Lifetime Extension, occasionally vehicles or plant may be necessary for maintenance of access roads, drainage networks and hardstands along with some minor landscaping works.

Small amounts of granular material may be imported to maintain access tracks and hardstands during the Proposed Lifetime Extension which will place intermittent minor demand on local quarries.

Meanwhile, the Proposed Offsetting Measures comprise the permanent removal of c. 105.5 ha of coniferous plantation forestry and the restoration of c17.7 ha of farmland for the benefit of hen harrier. Full details of the Proposed Offsetting Measures are also outlined in Chapter 4 and Appendix 7-7.

8.6 Likely Significant Effects and Associated Mitigation Measures

8.6.1 Do Nothing Scenario

If the Proposed Lifetime Extension were not to proceed, the existing Taurbeg Wind Farm turbines will be decommissioned in 2026, as per the existing permission.

During decommissioning of the wind farm, it is intended to limit groundworks other than to rehabilitate constructed areas such as turbine bases and hardstanding areas. This will be done by covering with topsoil to encourage vegetation growth and reduce run-off and sedimentation. The turbines will be removed and transported off-site and the turbine concrete bases will remain in the ground and backfilled.

A Decommissioning Plan is proposed as part of the Proposed Lifetime Extension. This is presented in Appendix 4-3 of this EIAR.

8.6.2 Proposed Offsetting Measures - Likely Significant Effects and Mitigation Measures

There are no proposed construction works associated with the Proposed Lifetime Extension.

The only works associated with the Proposed Project relate to the Proposed Offsetting Measures. These works are assessed in terms of the land, soils and geological environment below.

8.6.2.1 Potential Effects on Landcover/Land Take Due to Proposed Offsetting Measures

The main objective of the Proposed Offsetting Measures is to create, maintain and improve habitats for the benefit of hen harrier. It is proposed to permanently remove c. 105.5 hectares of plantation forestry which will create more biodiverse upland habitats suitable for foraging hen harrier. Approximately 10ha of felled material will be permanently removed offsite, with the remaining 95.5 ha of felled material being stacked into windrows on site.

Regarding the farmland area, this land will be permanently restored for the benefit of hen harrier through restoration measures such as planting and restoring of hedgerow, implementation of a rotational grazing scheme, linear wildlife crop sowing, cease on fertiliser application and predator fencing. The Proposed Offsetting Measures will have a positive effect on the land environment in these areas.

Pathway: Deforestation, targeted offsetting measures in the agricultural field including grassland management, wildlife crop planting and hedgerow maintenance.

Receptor: Land and Landcover.

Potential Pre-Mitigation Effect: Significant, positive, direct, likely, long term effect on land and landcover in Areas 1, 2 and 4. Moderate, positive, direct, likely, medium-term effect on land in Area 3.

Impact Assessment:

The effect will be the loss of ~17.7ha of managed agricultural land and ~105.5ha of coniferous forestry. These areas will be replaced by grassland and open heath/bog habitats.

The Proposed Offsetting lands are located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. The site synopsis report for this SPA states that almost half of this designated site is forested. A conservation objective for this SPA is to restore the extent and quality of the open heath and bog/scrub habitats which provide important nesting and foraging resources for the Hen Harrier. Therefore, the Proposed Offsetting Measures are in line with the conservation objectives of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA and will have a positive effect on the land environment.

Post Mitigation Residual Effect: The likely effect on land following the implementation of the Proposed Offsetting Measures is a significant, positive, direct, long term effect on land in Areas 1, 2 and 4 as these lands will be permanently deforested and with the land reverting to heath and open bog habitats. Meanwhile, a slight, positive, direct, long-term effect on Area 3 as the land will return to its current landuse at the end of the lifetime extension period.

Significance of Effects: For the reasons outlined above, it is considered that there will be a significant positive effect on landcover as a result of the Proposed Project.

8.6.2.2 Potential Effects Due to Erosion of Exposed Subsoils and Peat During Deforestation Associated with the Proposed Offsetting Measures

Deforestation is a major component of the Proposed Offsetting Measures with ~105.5ha of coniferous forestry proposed for deforestation.

During deforestation, there is a high likelihood of erosion of peat and spoil due to the disturbance of soils and subsoils associated with vehicle and plant movements. This also has associated potential effects on the aquatic environment, and therefore this aspect is further assessed in detail in Chapter 9 Hydrology and Hydrogeology.

Pathway: Vehicle movement, surface water and wind action.

Receptor: Peat and subsoils.

Pre-Mitigation Potential Effect: Negative, direct, slight, likely effect on peat and subsoils due to disturbance associated with deforestation.

Proposed Mitigation Measures:

The scheduling of deforestation activity aims to ensure that the local environment including the local peat and subsoils are protected. Deforestation is in line with current best practice guidelines with all coupes being under 25ha.

Furthermore, all proposed deforestation works will be in accordance with the best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and Forest Service guidance documents to ensure that deforestation results in minimal potential negative effects on the local peat, soil and subsoil environment.

In addition, the following mitigation measures will be implemented during deforestation operations:

- Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff;
- The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines;
- All machinery will be operated by suitably qualified personnel;

- These machines will traverse the site along specified off-road routes (referred to as racks or brash mats);
- Brash mats will be placed on all routes off the forest road to support the vehicles on soft ground, reducing peat and mineral soil disturbance, compaction and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur;
- As deforestation progresses, the harvester will collect brash produced by the deforestation and place it in front of the machine before it advances forward along the brash mat;
- The condition of the brash mats will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the deforestation works; and,
- The location of brash mats will be chosen to avoid wet and potentially sensitive areas.

Post Mitigation Residual Effect: The proposed deforestation works will result in the disturbance and erosion of peat and subsoils. However, with the implementation of mitigation measures outlined above the residual effect is a negative, direct, insignificant, likely effect on peat and subsoils due to disturbance associated with deforestation operations.

Significance of Effects: For the reasons outlined above, and with the implementation of the listed mitigation measures, no significant effects on peat and subsoils will occur.

8.6.2.3 Potential Contamination of Soil by Leakages and Spillages During the Proposed Offsetting Measures

Accidental spillage of petroleum hydrocarbons during refuelling of plant using in the Proposed Offsetting Measures is a pollution risk. The accumulation of small spills of fuels and lubricants during routine plant use can also be a significant pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. Large spills or leaks have the potential to result in significant effects (i.e., contamination of peat, subsoils and pollution of the underlying aquifer) on the geological and aquatic environment.

Pathway: Peat and subsoil and underlying bedrock pore space.

Receptor: Peat and subsoil, bedrock.

Pre-Mitigation Potential Effect: Negative, slight, direct, short-term, likely effect on peat, subsoils and bedrock.

Proposed Mitigation Measures:

- All road-going vehicles will be refuelled off-site;
- On-site re-fuelling will be required for forestry and excavator machinery;
- The on-site refuelling will be undertaken at a dedicated refuelling area at the existing entrance to Area 2. The refuelling will be completed using a double skinned bowser with spill kits kept on site for accidental leakages or spillages;
- The bowser will be refilled by a fuel lorry;
- Absorbent materials and pads will be kept on site in the event of accidental spillages;
- Only designated trained operatives will be authorised to refuel plant;
- Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system;
- Fuels stored on-site will be minimised. All storage areas will be bunded appropriately for the duration of the Proposed Offsetting Measures. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area;
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and

signs of damage;
- The plant used during Proposed Offsetting Measures will be regularly inspected for leaks and fitness for purpose; and,

Post Mitigation Residual Effect: The use and storage of hydrocarbons and small volumes of chemicals is a standard risk associated with projects involving works. Proven and effective measures to mitigate the risk of spills and leaks have been proposed above and will break the pathway between the potential source and the receptor. The residual effect is considered to be - Negative, imperceptible, direct, short-term, unlikely effect on peat and subsoils and bedrock.

Significance of Effects: For the reasons outlined above, and with the implementation of the proposed mitigation measures, no significant effects on peat, subsoils and bedrock will occur.

8.6.2.4 Potential Effects on Peat Stability

A Peat Stability Risk Assessment Report (PSRA) was completed by GDG at the Proposed Offsetting lands. The approach presented in the PSRA is in compliance with the guidelines for geotechnical/peat stability risk assessment as given in PLHRA (2017) and MacCulloch (2005). The peat stability risk assessment is attached in full as Appendix 8-1.

Peat instability or failure refers to a significant mass movement of a body of peat that would have an adverse impact on the surrounding environment. The potential significant effects of peat failure at the Proposed Offsetting lands may result in:

- Death or injury to site personnel;
- Damage to machinery;
- Damage or loss of infrastructure;
- Drainage disruption by blockage of drainage pathway by relocated peat and spoil;
- Site works damaged or unstable;
- Contamination of watercourses, water supplies by particulates; and,
- Degradation of the peat environment by relocation of peat and spoil.

The key hazards posed to peat stability during the deforestation works include the application of surcharge by plant tracking and by the placement of windrows.

However, the findings of the PSRA showed that the Proposed Offsetting lands predominantly have an acceptable margin of safety and are suitable for the Proposed Offsetting Measures. Some very localised areas are deemed to have a higher risk of instability due to local topography and additional mitigation measures have been proposed in these areas.

Pathway: Vehicle movement and placement of windrow.

Receptor: Peat and subsoils.

Pre-Mitigation Potential Effect: The findings of the PSRA showed that the Proposed Offsetting lands have an acceptable margin of safety, are suitable for the Proposed Offsetting Measures and is considered to be at low risk of peat failure. The pre-mitigation residual effect is considered to be - Negative, significant, direct, long term, likely effect on peat and subsoils.

Proposed Mitigation Measures:

Firstly, the key mitigation with regard peat stability risk at the Proposed Offsetting lands was the completion of a robust, multidisciplinary, multi-phased site investigation and peat stability risk assessment carried out in accordance with best practice guidance (PLHRAG, Scottish Government, 2017). The Proposed Offsetting lands have been selected using an iterative process to remove areas of higher risk for peat instability.

The findings of the PSRA, which involved analysis at 111 no. locations within the Proposed Offsetting lands, showed that these lands have an acceptable margin of safety and are suitable for the Proposed Offsetting Measures. The nature of the Proposed Offsetting Measures, which do not include any excavations, further limit the potential for a peat slide.

Notwithstanding the above, the management of peat stability and appropriate work practices will be inherent during the Proposed Offsetting Measures to ensure peat failures do not occur on site.

The following control measures will ensure the management of the risks for this site:

- Deforestation will be completed during periods of low rainfall;
- Appointment of experienced and competent contractors;
- The forestry works will be supervised by experienced and qualified personnel;
- Allocate sufficient time for the project to proceed safely with all peat stability mitigation measures;
- Set up, maintain and report findings from monitoring systems, including sightline monitoring (installation of monitoring posts is recommended where works are taking place in areas where peat depths exceed 2m. Monitoring posts should be observed at least once a day);
- Maintain vigilance and awareness through Tool-Box-Talks on peat stability;
- Prevent undercutting of slopes and unsupported excavations;
- Prevent placement of loads/overburden on marginal ground;
- Manage and maintain a robust drainage system;
- Surface water drainage plans should be implemented to account for modified flows created by the works, which in turn may affect peat stability;
- Store felled material including windrow in permitted areas only;
- A method statement and risk assessment which considers the potential causes and mitigations of peat instabilities and landslide is required and must be regularly communicated to all site staff. An observational approach by all site staff to the ground conditions and the risks should be promoted and any changes in the ground or site conditions should be reported and the risk dynamically assessed.

The PSRA identifies 5 no. Safety Buffer Zones where the low FoS value is caused by local factors such as locally higher slopes and do not represent a significant stability risk, provided the following mitigation measures are adhered to:

- The Safety Buffer Zones are to be marked out with warning tape;
- No large plant is permitted to enter these zones; and,
- No logs, windrows, stone or other material will be temporarily or permanently placed in these zones.

Material Storage Areas (18 no.) have also been identified in the PSRA where there is a low risk of instability in the natural state but are unsuitable for storage of materials. The mitigation measures prescribed for these areas include:

- No logs, windrows, stone or other materials will be temporarily or permanently placed in these areas;
- Any trees removed in these areas will be immediately removed and placed/stored at an appropriate locations;
- Plant used in these areas will be low ground bearing and only necessary plant will be used here; and,
- No excessive quantity or size of plant will be stored in these areas.

Where excessive movement has been observed in the installed monitoring (sightline monitoring) the following measures will be undertaken:

- All works will be suspended in the area;
- A competent Geotechnical Engineer will carry out an assessment of the peat instability including drainage. The competent Geotechnical Engineer will compile a report outlining the surveys undertaken, the potential cause of the instability, assessment of any increased risk caused by the instability, and the further measures required to manage this risk,
- An increased monitoring regime will be specified including increase in number of monitoring post lines, decrease on monitoring post spacing and an increase in the frequency of monitoring post observations,
- Should no further movement be detected, activities will be recommenced while maintaining the increased monitoring regime,
- Should further excessive movement be detected, the geotechnical engineer will need to be informed and the design of further reinstatement works will be required such as excavation of the disturbed material, installation of a granular berms or similar.

Post-Mitigation Residual Effect: A detailed PSRA has been completed for the Proposed Offsetting lands. The findings of that assessment have demonstrated that there is a low risk of peat failure as a result of the Proposed Offsetting Measures. With the implementation of the control measures outlined above the residual effect will be - Negative, imperceptible, direct, unlikely, long term effect on peat and subsoils.

Significance of Effects: No significant effects on soils and subsoils will occur.

8.6.3 Extended Operational Phase - Likely Significant Effects and Mitigation Measures

Very few potential direct impacts are envisaged during the Proposed Lifetime Extension. These may include:

- Some construction vehicles or plant may be necessary for maintenance of turbines which could result in minor accidental leaks or spills of fuel/oil;
- The transformer in the substation and transformers in each turbine are oil cooled. There is potential for spills / leaks of oils from this equipment resulting in contamination of soils and groundwater; and,
- In relation to indirect impacts a small amount of granular material may be required to maintain access tracks during operation which will place intermittent minor demand on local quarries.

8.6.3.1 Potential Effects Associated with Site Road Maintenance

In relation to indirect effects a small amount of granular material will be required to maintain access tracks/site roads during the Proposed Lifetime Extension which will place intermittent minor demand on local quarries.

Pathway: Peat, subsoil and bedrock pore space.

Receptor: Peat, subsoil and bedrock.

Potential Pre-Mitigation Effect: Negative, indirect, imperceptible, short term, likely effect on peat, subsoil and bedrock.

Proposed Mitigation Measures:

- Use of aggregate from nearby authorised quarries for use in road and hardstand maintenance.

Post Mitigation Residual Effect: The use of aggregate for site road maintenance will be minor and infrequent, and all material will be imported to the Site from local authorised quarries. The residual effect is considered to be - negative, imperceptible, indirect, short-term, unlikely effect on bedrock.

Significance of Effects: For the reasons outlined above, no significant effects on land, soils or geology will occur.

8.6.3.2 Potential Effects Associated with Site Vehicle/Plant Use

Plant and site vehicles used in site maintenance will be run on fuels and use hydraulic oils. Accidental spillage during refuelling of plant with petroleum hydrocarbons is a significant pollution risk to land, soils and associated ecosystems. The accumulation of small spills of fuels and lubricants during routine plant use can also be a pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, and is persistent in the environment.

There have been no accidental spillages or leakages of hydrocarbons at the Site to date.

Pathway: Peat, subsoil and bedrock pore space.

Receptor: Peat, subsoil and bedrock.

Potential Pre-Mitigation Effect: Negative, direct, slight, short term, unlikely effect on peat, subsoil and bedrock.

Proposed Mitigation Measures:

Adherence to the Operational and Environmental Management Plan (refer to Appendix 4-2 of the EIAR) with regard to the use of oils and fuels on the Site.

- Vehicles used during the Proposed Lifetime Extension will be refuelled off site before entering the site;
- Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; and,
- An emergency plan for the extended operational phase to deal with accidental spillages and breakdowns will be contained in the Operational and Environmental Management Plan.

Post-Mitigation Residual Effect: The use of hydrocarbons in plant and vehicles is a standard risk associated with all operational wind farm sites. Proven and effective measures to mitigate the risk of spills and leaks have been proposed above and will break the pathway between the potential source and the receptor. The residual effect is considered to be - negative, imperceptible, direct, short-term, unlikely effect on peat, subsoils, and bedrock.

Significance of Effects: For the reasons outlined above, no likely significant effects on land, soils, subsoils or bedrock will occur.

8.6.3.3 Potential Effects from Oils in Transformers

The transformer in the substation and transformers in each turbine are oil cooled. There is potential for spills / leaks of oils from this equipment resulting in contamination of soils and groundwater. Hydrocarbon has a high toxicity to humans, and all flora and fauna, and is persistent in the environment.

There have been no recorded spills or leaks of oils at the Site to date.

Pathway: Peat, subsoil and bedrock pore space.

Receptor: Peat, subsoil and bedrock.

Potential Pre-Mitigation Effect: Negative, direct, slight, short term, unlikely effect on peat, subsoil and bedrock.

Proposed Mitigation Measures:

- All transformers and substation areas are bunded to 110% of the volume of oil used in each transformer/substation; and,
- An emergency plan for the extended operational phase to deal with accidental spillages will be contained in the Operational and Environmental Management Plan.

Post-Mitigation Residual Effect: The use of hydrocarbons in transformers and substations is a standard risk associated with all operational wind farm sites. Proven and effective measures to mitigate the risk of spills and leaks have been proposed above and will break the pathway between the potential source and the receptor. The residual effect is considered to be - negative, imperceptible, direct, short-term, unlikely effect on peat, subsoils, and bedrock.

Significance of Effects: For the reasons outlined above, no likely significant effects on land, soils, subsoils or bedrock will occur.

8.6.4 Decommissioning Phase - Likely Significant Effects and Mitigation Measures

The potential effects associated with decommissioning of the existing Taurbeg Wind Farm will be similar to those associated with construction of the Taurbeg Wind Farm but of reduced magnitude due to the measures as detailed in the proposed Decommissioning Plan.

Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled. All above-ground turbine components will be separated and removed off-site. It is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option as excavation works can be avoided.

It is proposed that site roadways will be left in situ, as appropriate and where required, to facilitate on-going access and any commercial forestry uses. It is proposed to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works.

During decommissioning, it will be possible to reverse or at least reduce some of the potential impacts caused by the construction of Taurbeg Wind Farm by rehabilitating areas such as turbine bases, hard standing areas. This will be done by covering hardstand areas with peatland vegetation/scraw or poorly humified peat to encourage vegetation growth and reduce run-off and sedimentation. During the decommissioning works tried and tested, best practice, mitigation measures will be implemented at the site with respect to hydrocarbons and will ensure that there is no potential for the contamination of the soils and geological environment. However, as noted in the Scottish Natural Heritage report (SNH) Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms (SNH, 2013) technological advances and preferred approaches to reinstatement are likely to change during the Proposed Lifetime Extension. According to the SNH guidance, it is therefore:

> *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".*

No significant effects on the land, soils and geological environment will occur during the decommissioning phase of the Taurbeg Wind Farm.

The deforestation of 105.5ha of forestry and the restoration of 17.7ha of farmland for the benefit of hen harrier will be a permanent change on the land environment. There is no decommissioning phase associated with the Proposed Offsetting Measures.

8.6.5 Risk of Major Accidents and Disasters

Due to the nature of the Site (i.e. mountainous terrain with peat covered slopes) the main risk of a major accident or disaster would be associated with a peat slide.

However, the Taurbeg Wind Farm has been in operation for over 19 years without any major accidents or disasters, therefore none are likely to occur during the proposed 10-year lifetime extension.

Furthermore, the Proposed Lifetime Extension comprises the extension of life of an existing wind farm and no further construction works are proposed at the Site. Therefore, there will be no excavation or movement of peat which could contribute to instability. Geotechnical inspections of the Site and the existing infrastructure have not found any signs of instability and concluded that the site is in good condition.

Therefore, given the results of the geotechnical engineers combined with the absence of any construction works, the residual risk of a landslide occurring at the Site is determined to be negligible/none.

With regards to the Proposed Offsetting lands, the PSRA states that due to the high factors of safety and negligible risk of peat landslides identified on site, it is not anticipated that peat failure will occur on site. However, in the event of peat failure (e.g. tension cracking, surface rippling, sliding), the following measures will be implemented by the contractor:

- All members of the project team will be alerted immediately or as it is safe to do so;
- All site works will be ceased with immediate effect, and all available resources will be used for the management and mitigation of the risks posed by the event;
- Localised peat slides that do not present a risk to watercourses will be stabilised where possible by rock infill and granular material (to be sourced from nearby quarries). The area will then be assessed by competent engineers, and further stabilisation measures will be implemented where necessary; and,
- The key initial activity will be to prevent displaced materials from reaching any watercourses or sensitive environments. Given the terrain of the Proposed Offsetting lands, the key risk is the development of a propagation landslide or slip within topographic valleys and watercourses. Where possible, catch ditches on land or within these topographic valley and watercourses will be constructed to prevent further run out of the disturbed peat or spoil material.

The contractor will be responsible for providing suitable contingencies outlined within the Proposed Offsetting Measures method statement that will be prepared prior to the commencement of the works. The contractor will additionally need to undertake a confirmatory PSRA prior to the commencement of the Proposed Offsetting Measures.

8.6.6 Assessment of Health Effects

Potential health effects arise mainly through the potential for soil and ground contamination. The existing Taurbeg Wind Farm is not a recognized source of pollution (e.g. it's not a waste management site, or a chemical plant), and so the potential for effects during the Proposed Lifetime Extension are negligible.

Hydrocarbons will be used onsite during operation; however the volumes will be very small in the context of the scale of the Site and will be handled and stored in accordance with the Operational and

Environmental Management Plan and best practice mitigation measures. The potential worst case residual effects associated with soil or ground contamination are imperceptible and therefore, subsequent health effects are imperceptible.

8.6.7 Potential Cumulative Effects

As there is no requirement for significant excavations/earth works, there is no potential for significant cumulative effects in-combination with the grid connection and other local developments on the land, soils and geology environment.

Other projects outside the Site do not have the potential to reduce or increase the magnitude of effects of the Proposed Lifetime Extension on Land, Soils and Geology as off-site indirect effects will not occur due to the Proposed Lifetime Extension.

The only way the Proposed Lifetime Extension or Proposed Offsetting Measures can have cumulative effects with other off site projects and plans is via the drainage and off site surface water network, and this hydrological pathway is assessed in Chapter 9 Hydrology and Hydrogeology.

8.6.8 Post Construction Monitoring

None required.

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Hydrology and Hydrogeology

Taurbeg Wind Farm Extension of Operational Life

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9. HYDROLOGY AND HYDROGEOLOGY

9.1 Introduction

9.1.1 Background and Objectives

Hydro-Environmental Services (HES) was engaged by MKO to carry out an assessment of the potential likely and significant effects of the Proposed Project (Proposed Lifetime Extension for the existing Taurbeg Wind Farm and Proposed Offsetting Measures) on water aspects (Hydrology and Hydrogeology) of the receiving environment.

Details of the Proposed Project are described in full in Chapter 4 of this Environmental Impact Assessment Report (EIAR).

In summary, planning permission is sought for the continued operation of the existing Taurbeg Wind Farm as permitted by Cork County Council (Pl Ref No: 02/3608) for a further period of 10 years from the date of the expiry of the current planning permission (2026) as per Condition No. 7 of the existing consent. The existing Taurbeg Wind Farm comprises of 11 no. turbines. The grid connection does not form part of the Proposed Lifetime Extension but is assessed cumulatively.

The objectives of the assessment are:

- Produce a baseline study of the existing water environment (surface water and groundwater, i.e. natural resources) at the Site and Proposed Offsetting lands;
- Identify likely significant effects of the Proposed Project on surface water and groundwater natural resources during the extended operational period and the decommissioning phase;
- Identify mitigation measures to avoid, reduce or offset significant negative effects;
- Assess significant residual effects; and,
- Assess cumulative hydrological effects of the Proposed Project and other local developments (as described in Chapter 2; Section 2.11 of this EIAR).

As detailed in Section 1.1.1 of the EIAR, this chapter uses for the following terminology: 'Proposed Lifetime Extension', 'the Site', the 'Proposed Offsetting Measures' , the 'Proposed Offsetting lands' and the 'Proposed Project'.

9.1.2 Statement of Authority

Hydro-Environmental Services (HES) are a specialist hydrological, hydrogeological and environmental practice that delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

Our core areas of expertise and experience include upland hydrology and windfarm drainage design. We routinely complete impact assessments for hydrology and hydrogeology for a large variety of project types.

This chapter of the EIAR was prepared by Michael Gill and Conor McGettigan.

Michael Gill (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer and Hydrogeologist with over 22 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms and renewable projects in Ireland. He has substantial experience in surface water drainage design and SUDs design and surface

water/groundwater interactions. For example, Michael has worked on the EIS for Oweninny WF, Cloncreen WF, Derrinlough WF, and Yellow River WF, and over 100 other wind farm-related projects across the country including several lifetime extension applications.

Conor McGettigan (BSc, MSc) is an Environmental Geoscientist with over 4 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor has prepared the hydrology and hydrogeology chapter of environmental impact assessment reports for several wind farm development on peatlands. Conor also routinely prepares hydrological and hydrogeological assessment reports, WFD compliance assessment reports and flood risk assessments for a variety of development types including wind farms.

9.1.3 Relevant Legislation

The EIAR is prepared in accordance with the requirements of European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive') as amended by Directive 2014/52/EU.

The requirements of the following legislation are also complied with:

- Planning and Development Acts, 2000 (as amended);
- Planning and Development Regulations, 2001 (as amended);
- S.I. No 296/2018: European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which transposes the provisions of the EIA Directive as amended by the Directive 2014/52/EU into Irish Law;
- S.I. No. 477/2011: European Communities (Birds and Natural Habitats) Regulations, implementing EU Directives 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) and 79/409/EEC on the conservation of wild birds (the Birds Directive);
- S.I. No. 293/1988: Quality of Salmon Water Regulations;
- Water Framework Directive (2000/60/EC) (as amended by Decision No. 2455/2011/EC; Directive 2008/32/EC; Directive 2008/105/EC; Directive 2009/31/EC; Directive 2013/39/EU; Council Directive 2013/64/EU; and Commission Directive 2014/101/EU ("WFD").
- S.I. No. 272/2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, and S.I. No. 722/2003 European Communities (Water Policy) Regulations, as amended, which implement EU Water Framework Directive (2000/60/EC) and provide for the implementation of 'daughter' Groundwater Directive (2006/118/EC).
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003);
- S.I. No: 122/2010: European Communities (Assessment and Management of Flood Risks) Regulations, resulting from EU Directive 2007/60/EC;
- S.I. No. 684/2007: Waste Water Discharge (Authorisation) Regulations, resulting from EU Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (the Groundwater Directive);
- S.I. No. 9/2010: European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended; and,
- S.I. No. 296/2009: European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009, as amended.

9.1.4 Relevant Guidance

The Hydrology and Hydrogeology chapter of this EIAR is carried out in accordance with the guidance contained in the following:

- Circular Letter PL 1/2017: Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive);
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Institute of Geologists Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- DoE/NIEA (2015): Wind farms and groundwater impacts - A guide to EIA and Planning considerations;
- OPW (2009) The Planning System and Flood Risk Management;
- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Wind Farm Development Guidelines for Planning Authorities (2006);
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);
- PPG1 - General Guide to Prevention of Pollution (UK Guidance Note);
- PPG5 – Works or Maintenance in or Near Water Courses (UK Guidance Note);
- CIRIA (Construction Industry Research and Information Association) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006);
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001;
- Land Types for Afforestation (Forest Service, 2016b);
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b); and,
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018).

9.2 Assessment Methodology

9.2.1 Desk Study

A desk study of the Site and Proposed Offsetting lands was completed in January and February 2024 to collect all relevant hydrological, hydrogeological and meteorological data for the above. The desk study was completed to supplement site walkover surveys and site investigations. The desk study information has been checked and updated, where necessary, in June 2025.

The desk study involved consultation with the following sources:

- Environmental Protection Agency Databases (www.epa.ie);
- Environmental Protection Agency's Hydrotool Database (www.catchments,.ie);
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Met Eireann Meteorological Databases (www.met.ie);
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- Water Framework Directive Map Viewer (www.catchments.ie);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 21 (Geology of Kerry - Cork); Geological Survey of Ireland (GSI, 1999);
- Geological Survey of Ireland - Groundwater Body Characterisation Reports;
- OPW Flood Mapping (www.floodmaps.ie);
- GSI's Maximum Historic Surface and Groundwater Flood Mapping (www.floodinfo.ie); and,
- Aerial Photography, 1:5000, and 6" base mapping.

The following documents relating to the Taurbeg Wind Farm were also reviewed and are referenced as required in this chapter:

- Whiteford Geoservices Ltd, 2004. Ground Investigation for Proposed Wind Farm Site at Taurbeg, Rockchapel, Co. cork (Report No. 386/04) (Appendix 8-2);
- Environmental Impact Statement for the existing Taurbeg Wind Farm Pl. Reg. Ref: N/02/3608 (2002); and,
- RPS Geotechnical Report – 2015/2016.

9.2.2 Baseline Monitoring and Site Investigations

Hydrological walkover surveys of the Site, including detailed drainage mapping, was undertaken by HES on 26th March 2024 and 14th August 2024. These surveys were completed by Conor McGettigan of HES (please refer to Section 9.1.2 for qualifications and experience). Hydrological monitoring on these dates included surface water flow monitoring, field hydrochemistry and grab sampling. The monitoring and sampling completed in March 2024 occurred during a period of mixed weather whilst the August 2024 sampling was completed during a period of dry weather.

Recent site investigations to address the Water Section of the EIAR included the following:

- HES completed site walkover surveys and drainage mapping at the Site on 26th March 2024 and 14th August 2024 whereby water flow directions and drainage patterns were recorded;
- A total of 10 no. gouge core sample points were undertaken by HES across the Site to investigate peat and mineral subsoil lithology;
- Field hydrochemistry measurements (electrical conductivity, pH, dissolved oxygen, temperature and turbidity) and surface water flow measurements were taken to determine the origin and nature of surface water flows draining the Site;
- 2 no. rounds of 4 no. surface water samples were taken to determine the contemporary baseline water quality of the primary surface waters draining the Site;
- GDG completed site investigations at the Proposed Offsetting lands and the surrounding area in October 2024. In total 214 no. peat probes (107 no. within the Proposed Offsetting lands) and 16 no. shear vane tests (4 no. within the Proposed Offsetting lands) were completed; and GDG completed a Peat Stability Risk Assessment for the Proposed Offsetting lands which is included as Appendix 8-1.

HES also completed a detailed review of the previous planning applications and associated planning files and site investigations prior to completing further site investigations for the current application. The previous site investigations completed by Whiteford Geoservices (Appendix 8-2) in 2004, comprising of trial pits (13 no.) and boreholes (2 no.) has also been used in the preparation of this chapter. In addition, site walkover inspections of the Site were completed by a Geotechnical Engineer from RPS in May 2015 and February 2016.

9.2.3 Scoping and Consultation

The scope for this assessment has been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties as summarised in Section 2.9 of Chapter 2 of the EIAR. Consultation responses relating to the water environment were received from the Geological Survey of Ireland (GSI) and Uisce Éireann. Matters raised by consultees in their responses with respect to the water environment are summarised in Table 9-1 below.

Table 9-1: Summary of Water Environment Related Scoping Responses

Consultee	Description	Addressed in Section
GSI	The GSI note that site is underlain by a 'Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones' and that groundwater vulnerabilities within the area are variable. The GSI recommend the use of the Groundwater Viewer to identify areas of High to Extreme Vulnerability and 'Rock at or near surface' as any groundwater-surface water interactions would be greatest in these areas	Groundwater vulnerability is discussed in Section 9.3.10.
Uisce Éireann	Standard letter response	Water supplies are detailed in Section 9.3.16.

9.2.4 Impact Assessment Methodology

The guideline criteria (EPA, May 2022) require that the baseline environment is described in terms of the context, character, significance and sensitivity of the existing environment. The description of the baseline environment is Step 5 of the information which must be included in an EIAR as per the guideline criteria (2022).

The assessment of effects follows the description of the baseline environment and is Step 6 of the information which must be included in an EIAR. The guideline criteria for the assessment of effects states that the purpose of an EIAR is to identify, describe and present an assessment of the likely significant effects. The likely effects are described with respect to their quality (positive, neutral or negative), significance (imperceptible to profound), extent (i.e. size of area or number of sites effected), context (is the effect unique of being increasingly experienced), probability (likely or unlikely), duration (momentary to permanent), frequency and reversibility. The descriptors used in this environmental impact assessment are those set out in the EPA (2022) Glossary of effects as shown in Chapter 1 of this EIAR.

In addition to the above methodology, the sensitivity of the water environment receptors was assessed on completion of the desk study and baseline study. Levels of importance which are defined in Table 9-2 for hydrology and Table 9-3 for hydrogeology are used to assess the potential effect that the Proposed Project may have on them.

Table 9-2: Estimation of Importance of Hydrology Criteria (NRA, 2008)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation, e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a	River, wetland or surface water body ecosystem protected by national legislation – NHA status.

Importance	Criteria	Typical Example
	regional or national scale	Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for a wide range of leisure activities.
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding.
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes. Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people.

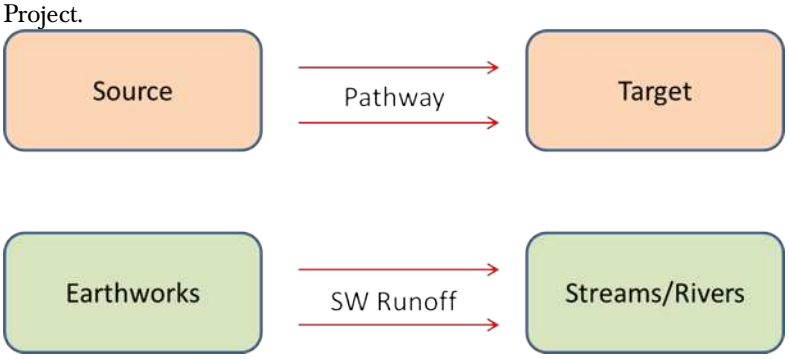
Table 9-3: Estimation of Importance of Hydrogeology Criteria (NRA, 2008)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g. SAC or SPA status.
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation - NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source.

Importance	Criteria	Typical Example
		Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes.

9.2.5 Overview of Impact Assessment Process

The conventional source-pathway-target model (see below, top) was applied to assess potential effects on downstream environmental receptors (see below, bottom as an example) as a result of the Proposed Project.



Where potential effects are identified, the classification of effects in the assessment follows the descriptors provided in the Glossary of Impacts contained in the following guidance documents produced by the Environmental Protection Agency (EPA):

- Environmental Protection Agency (May 2022): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

The description process clearly and consistently identifies the key aspects of any potential effect source, namely its character, magnitude, duration, likelihood and whether it is of a direct or indirect nature.

The assessment of effects is Step No. 6 of 7 in the EIAR process. In order to provide an understanding of the stepwise impact assessment process applied below (Sections 9.4.2 to 9.4.4), a summary guide is presented below in Table 9-4, which defines the steps (Steps 6a to 6g) taken in each element of the impact assessment process. The guide also provides definitions and descriptions of the assessment process and shows how the source-pathway-target model and the EPA impact descriptors are combined.

Using this defined approach, this impact assessment process is then applied to all wind farm construction, operation and decommissioning activities (including the substation and grid connection) which have the potential to generate a source of significant adverse impact on the geological and hydrological/ hydrogeological (including water quality) environments.

Table 9-4: Impact Assessment Process Steps

Step 6a	Identification and Description of Potential Impact Source This section presents and describes the activity that brings about the potential impact or the potential source of pollution. The significance of effects is briefly described.	
Step 6b	Pathway / Mechanism:	The route by which a potential source of impact can transfer or migrate to an identified receptor. In terms of this type of development, surface water and groundwater flows are the primary pathways, or for example, excavation or soil erosion are physical mechanisms by which potential impacts are generated.
Step 6c	Receptor:	A receptor is a part of the natural environment which could potentially be impacted upon, e.g. human health, plant / animal species, aquatic habitats, soils/geology, water resources, water sources. The potential impact can only arise as a result of a source and pathway being present.
Step 6d	Pre-mitigation Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impact before mitigation is put in place.
Step 6e	Proposed Mitigation Measures:	Control measures that will be put in place to prevent or reduce all identified significant adverse impacts. In relation to this type of development, these measures are generally provided in two types: (1) mitigation by avoidance, and (2) mitigation by (engineering) design.
Step 6f	Post-Mitigation Residual Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impacts after mitigation is put in place.
Step 6g	Significance of Effects:	Describes the likely significant post-mitigation effects of the identified potential impact source on the receiving environment.

9.2.6 Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation of the Hydrology and Hydrogeology Chapter of the EIAR.

9.2.7 Study Area

The study area for the hydrological and hydrogeological impact assessment is defined by the regional surface water catchments and groundwater bodies within which the Site and the Proposed Offsetting lands are located.

A regional hydrology map showing WFD surface water catchments and sub-catchments is included as Figure 9-1. The relevant surface water catchments within which the Site and the Proposed Offsetting lands are located are detailed in Section 9.3.3. Meanwhile, the bedrock aquifers and groundwater bodies which underlie the Site and the Proposed Offsetting lands are detailed in Section 9.3.8.

9.3 Receiving Environment

9.3.1 Site Description and Topography

9.3.1.1 Taurbeg Wind Farm

The Site is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork. The Site is located in the townlands of Taurbeg, Glasheenanargid, Foiladaunand Taurmore. The Site has a total area of ~112hectares (ha).

The Site is located in an upland setting and is situated on the southern foothills of the Mullaghareirk Mountain range. Topography within the Site ranges from ~302metres above Ordnance Datum (mOD) in the northeast to ~405mOD in the southwest. The lowest elevations are found in the northeast of the Site, at the existing entrance to Taurbeg Wind Farm. Topography rises to the west and there are three local peaks within the Site, one standing at an elevation of ~392mOD in the north, with two local peaks standing at ~405mOD further south.

The Site is drained by several streams which ultimately drain to the Feale or Blackwater rivers. The land use within the Site comprises of a mixture of renewable energy production, peat bogs, coniferous forestry and transitional woodland scrub.

The existing Taurbeg Wind Farm is accessed via the wind farm site entrance off the L5005 local road, in the townland of Taurbeg and is served by a network of existing wind farm access roads.

9.3.1.1.1 *Existing Infrastructure*

The existing development footprint of Taurbeg Wind Farm is ~3.76ha, representing ~3% of the Site (~112ha).

Taurbeg Wind Farm comprises of 11 no. existing wind turbines, with an estimated installed capacity of 25.3 Megawatt (MW). The total footprint of the turbines and their associated hardstands is ~3,891m^2. The turbine base elevations range from 330mOD (T7) to 401mOD (T11). Each wind turbine is secured to a reinforced concrete foundation. No piled foundations have been installed at the Site. The existing foundations are circular in plan with an average area of 100m^2. The existing hardstand areas around each turbine comprise of levelled and compacted hardcore. The existing hardstand areas vary slightly at each of the 11 no. turbines, with an average area of 722m^2.

During the initial construction of the existing wind farm, existing tracks were upgraded and new access roads were constructed to provide access within the Site and to connect wind turbines and associated infrastructure. Site roads were constructed of consolidated gravel with an average running width of 5.5m and a total length of 8.4km. The current footprint of the existing roads at the Site is 32,230m^2.

Each turbine is connected to the on-site electricity substation through underground medium voltage (MV) electricity and communications cabling. Multicore fibre-optic cabling connects each wind turbine to the wind farm control building. The electricity and fibre-optic cabling run in trenches below the ground surface, along the sides of or underneath the internal roadways. The routes of the cabling ducts follow the access tracks to each turbine location.

The existing substation compound measures ~1,428m^2. A 38kV underground cable runs between the onsite substation and a mast at the south of the Site. A 38kV overhead line runs from the mast to the existing Glenlara 100kV Substation.

There are no changes proposed to the existing Taurbeg Wind Farm infrastructure or grid connection as part of the Proposed Lifetime Extension.

9.3.1.1.2 *Proposed Offsetting Measures*

The Proposed Offsetting lands are located in townlands of Coom and Knockatee, Co. Kerry, ~12km west/southwest of the existing Taurbeg Wind Farm. The Proposed Offsetting lands consist of 4 no. parcels of land proposed for hen harrier habitat creation, 3 in the townland of Coom (Areas 1, 2 and 4) and 1 no. further north in the townland of Knockatee (Area 3). The Proposed Offsetting Measures comprise the permanent removal of c. 105.5 ha of coniferous plantation forestry and the restoration of c.17.7 ha of farmland for the benefit of hen harrier. The total area of the Proposed Offsetting lands is ~123.2ha.

The Proposed Offsetting lands are located on the slopes of Mount Eagle which stands at an elevation of 431mOD. Topography within the Proposed Offsetting lands is steeply sloping and ranges from ~200 to ~380mOD.

The Proposed Offsetting lands are located in an area dominated by coniferous forestry plantations. The northwestern Proposed Offsetting lands (~17.7ha) (Area 3) are located in an agricultural field whilst the remaining lands (~105.5ha) are located in coniferous forestry plantations (Areas 1, 2 and 4).

9.3.2 Water Balance

9.3.2.1 Taurbeg Wind Farm

Long term rainfall and evaporation data were sourced from Met Éireann. The 30-year annual average rainfall (AAR) recorded at the Newmarket Garda Station, located ~7.6km southeast of the Site are presented in Table 9-5. The long-term AAR at Newmarket Garda Station is 1,198mm/year.

However, the AAR at Newmarket Garda Station may underestimate the actual AAR at the Site due to the elevation difference (the highest elevations at the Site (~405mOD) are ~250m higher than the elevation of Newmarket Garda Station (~157mOD).

Met Éireann also provide a grid of AAR for the entire country for the period of 1991 to 2020. Based on this more site-specific modelled rainfall values, the average annual rainfall at the Site ranges from 1,698 to 1,744mm/year. The AAR is 1,721mm/yr (this is considered to be the most accurate estimate of AAR from the available sources).

Table 9-5 Local Average long-term Rainfall Data (mm)

Station		X-Coord		Y-Coord		Ht (MAOD)		Opened		Closed		
Newmarket G.S		131,800		107,400		157		1944		1986		
Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total
144	107	97	72	81	68	65	85	98	123	124	137	1,198

The closest synoptic station where the average potential evapotranspiration (PE) is recorded is at Shannon Airport, ~50km northeast of the Site. The long-term average PE for this station is 562.6mm/yr. This value is used as the best estimate of the Site PE. Actual Evaporation (AE) at the Site is estimated as 534mm/yr (which is 0.95 × PE).

The effective rainfall (ER) represents the water available for runoff and groundwater recharge. The ER for the Site is calculated as follows:

Effective rainfall (ER) = Average Annual Rainfall (AAR) – Actual Evaporation (AE)

= 1,721mm/yr – 534mm/yr

ER = 1,187mm/yr

Groundwater recharge coefficient estimates are available from the GSI (www.gsi.ie). Within the Site recharge coefficients range from 4% in areas of blanket peat to 85% in areas where rock is close to or at the ground surface.

An estimate of ~48mm/year average annual recharge is given for the Site. This calculation is based on a recharge coefficient of 4%. A recharge coefficient of 4% at the lower end of the GSI scale was chosen due to the coverage of blanket peat, the sloping nature of the local area and the low permeability of the underlying bedrock aquifer. This means that the hydrology of the Site is characterised by high surface water runoff rates and relatively low groundwater recharge rates. This is supported by on-site observations made during the site walkover surveys whereby a high density of surface water drainage features were recorded within the Site.

Therefore, conservative annual recharge and runoff rates for areas of the Site which are covered in peat are estimated to be ~48mm/yr and ~1,139mm/yr respectively.

Climate change projections for Ireland are provided by Regional Climate Models (RCM's) downscaled from larger Global Climate Models (GCM's). Projections for the period 2041-2060 (mid-century) are available from Met Eireann. The data indicates a projected decrease in summer rainfall from 0 to 13% under the medium-low emission range scenario and an increase in the frequency of heavy precipitation events of ~20%. In total the projected annual reduction in rainfall near the Site is ~8% under the medium-low emission scenario and ~6% under the high emissions scenario. As stated above the local average long term rainfall data for the Site is estimated to be ~1,721mm/yr. Under the medium-low emissions scenario this may reduce to ~1,583mm/yr, while under the high emissions scenario this figure may reduce to ~1,618mm/yr.

In addition to average rainfall data, extreme value rainfall depths are available from Met Éireann. A summary of various return periods and duration rainfall depths for the Site are presented in Table 9-6.

Table 9-6 Return Period Rainfall Depths (mm)

Return Period (Years)				
Storm Duration	1	5	30	100
5 mins	3.9	5.9	8.9	11.6
15 mins	6.4	9.6	14.6	19
30 mins	8.7	12.8	19	24.3
1 hour	11.8	17	24.8	31.3
6 hours	25.9	35.4	48.9	59.7
12 hours	35	47	63.6	76.7
24 hours	47.5	62.4	82.7	98.5
2 days	62.5	80.1	103.2	120.8

9.3.2.2 Proposed Offsetting Measures

In relation to the Proposed Offsetting lands, the AAR (1991-2020) is mapped by the GSI to range from 1,668 to 1,732mm/yr, with an average of 1,700mm/yr. Recharge coefficients in this area are typically

mapped by the GSI as 22%. Based on the above, and the AE at Shannon Airport, the annual recharge and runoff rates for the Proposed Offsetting lands are ~257 and 1,443mm/yr respectively.

9.3.3 Regional and Local Hydrology

9.3.3.1 Taurbeg Wind Farm

Regionally, the Site is located in 2 no. regional surface water catchments. The vast majority of the Site, including 10 of the 11 no. existing turbines associated with the Taurbeg Wind Farm are located in the Tralee Bay-Feale surface water catchment within Hydrometric Area No. 23 of the Shannon River Basin District. Meanwhile, the south of the Site, including 1 no. existing turbine, is mapped within the Blackwater (Munster) surface water catchment within Hydrometric Area No. 18 of the South Western River Basin District.

The Tralee Bay-Feale Regional Surface Water Catchment includes the area drained by the River Feale and all streams entering tidal water in Tralee Bay and between Clogher Head and Kilconly Point, Co. Kerry, draining a total area of 1,784km^2. Within this regional surface water catchment, the Site is located in the Feale_SC_010 WFD river sub-catchment. The Feale River rises in the Mullaghareirk Mountains and flows to in a south westerly direction, ~2.7km north of the Site.

More locally, within the Feale_SC_010 WFD river sub-catchment, the Site is located in 2 no. WFD river sub-basins. 8 no. turbines and the existing substation location are mapped in the Feale_010 WFD river sub-basin whilst 2 no. turbines are mapped in the Glenacarney_010 WFD river sub-basin to the west. The EPA also map several watercourses in the area of the Site. Within the Feale_010 WFD river sub-basin, 2 no. 1st order streams[1] emerge from within the Site. These watercourses are referred to by the EPA as the Knockahorrea East and the Glennaknockane streams. These streams flow to the east and merge to the east of a local road on the boundary between the townlands of Taurbeg and Glennaknockane. This watercourse then flows to the north and discharges into the Feale River at Rockchapel, ~3.2km to the north. Meanwhile, within the Glenacarney_010 WFD river sub-basin, the EPA map a 1st order stream, referred to as the Glasheenanargid stream, to flow to the west and discharges into the Glenacarney River ~600m west of the Site. The Glenacarney River flows to the north and discharges into the Feale River ~3.8km to the northwest. The Feale River continues to flow to the northwest and discharges into the Feale Estuary to the west of Listowel.

Meanwhile, the Blackwater (Munster) Regional Surface Water Catchment includes the area drained by the River Blackwater and all streams entering tidal water between East Point and Knockaverry, Youghal, Co. Cork, draining a total area of 3,310km^2. Within this regional surface water catchment, the Site is located in the Dalua_SC_010 WFD river sub-catchment. The Dalua River flows to the south ~5km east of the Site.

More locally within the Dalua_SC_010 WFD river sub-catchment, the Site is mapped within the Owenkeal_010 and Glenlara_010 WFD river sub-basins. No infrastructure associated with the existing Taurbeg Wind Farm is located in the Owenkeal_010 WFD river sub-basin, while 1 no. turbine (T10) is located in the Glenlara_010 WFD river sub-basin. 2 no. 1st order streams are mapped by the EPA to flow to the southeast from the Site. These streams merge and discharge into the Glenlara River ~2.5km to the southeast. The Glenlara River continues to flow to the southeast and discharges into the Dalua River to the west of Newmarket Town. The Dalua River discharges into the Allow River at Kanturk, ~16km to the southeast.

A regional hydrology map is shown in Figure 9-1, while Figure 9-2 presents a local hydrology map.

[1] A 1st order stream is the smallest of streams and consist of small tributaries. There 1st order stream feed larger streams but do not generally have any tributaries themselves. These streams form in upland areas and slow quickly downstream. 1st and 2nd order streams are also referred to as headwater streams.

9.3.3.2 Proposed Offsetting Measures

The Proposed Offsetting lands are located in 2 no. regional surface water catchments. In the west, the Proposed Offsetting lands are located in the Laune-Maine-Dingle Bay regional surface water catchment (Hydrometric Area 22) while the southeast is mapped in the Tralee Bay Feale regional surface water catchment (Hydrometric Area 23).

Within the Tralee Bay Feale regional surface water catchment, the Proposed Offsetting lands are mapped in the Feal_SC_030 WFD river sub-catchment and the Clydagh (Feale)_010 WFD river sub-basin. Within this sub-basin, the Proposed Offsetting lands are drained by the Glengarriff River which in the vicinity of the Proposed Offsetting lands is referred to by the EPA as the Tooreennascarty Stream. This stream flows to the northwest, to the east of Area 4 before it veers to the northeast. A tributary stream flows between 2 no. Proposed Offsetting lands (Area 1 and Area 4) before it discharges into the Glengarriff River. This river, also referred to by the EPA as the Clydagh River, continues to flow to the northeast, before it discharges into the Feale River near Clydagh Bridge, ~10.5km northeast of the Proposed Offsetting lands.

Within the Laune-Maine-Dingle Bay regional surface water catchment, the Proposed Offsetting lands are mapped in the Maine_SC_010 WFD river sub-catchment and the Shanowen (Maine)_010 WFD river sub-basin. Within this WFD river sub-basin a 2nd order stream, referred to as the Knockatee Stream is mapped to flow to the south along the western border of the agricultural field which is included in the Proposed Offsetting lands (Area 3). Meanwhile, the Croaghane Stream is mapped to flow to the west, ~30m to the south of Area 3. These 2 no. streams merge to form the Croaghane River. Further to the south, the Proposed Offsetting lands are drained by the Cloone (Shanowen) River. The Cloone and Croaghane rivers flow to the west and merge to form the Shanowen River ~5.3km west of the Proposed Offsetting lands near Fairfield Bridge. The Shanowen River discharges into the Maine River near Castleisland.

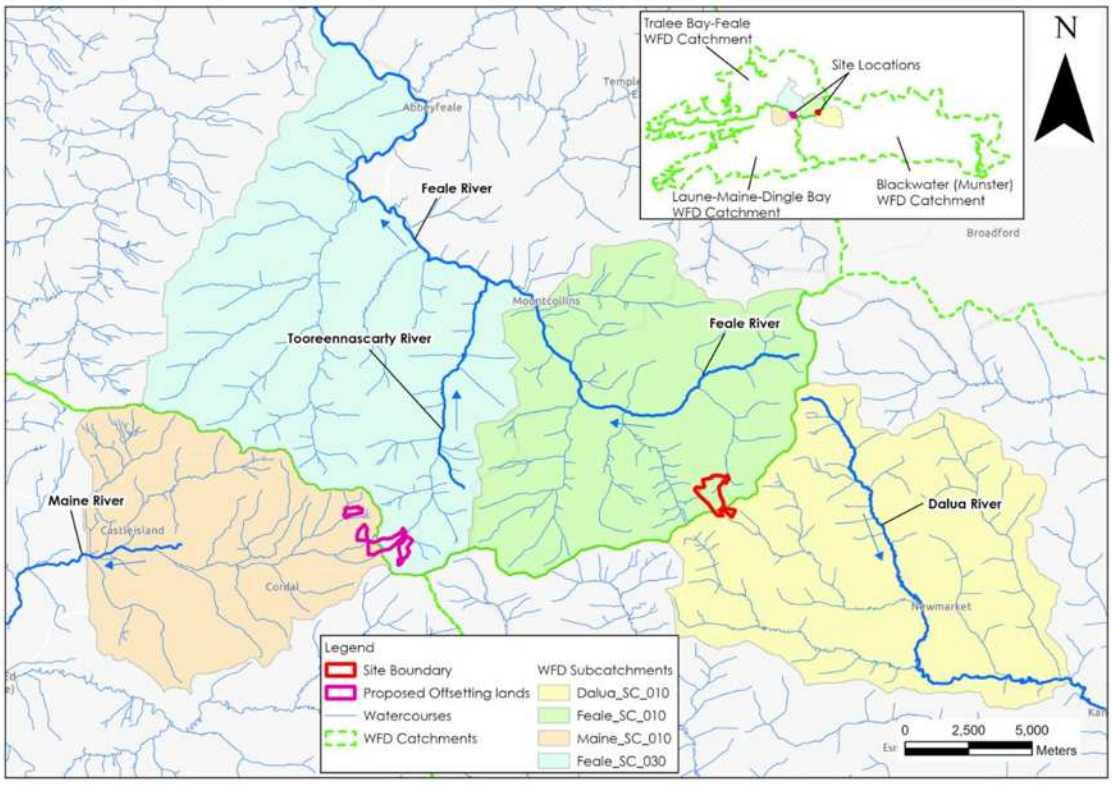


Figure 9-1: Regional Hydrology Map

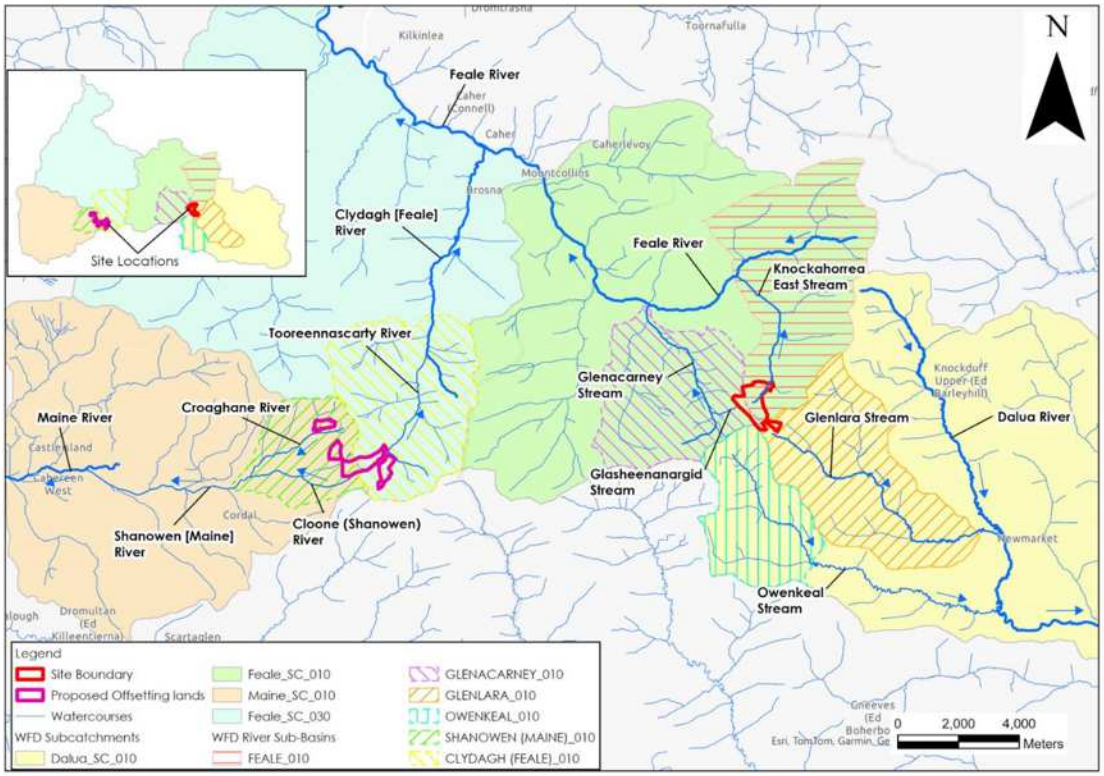


Figure 9-2: Local Hydrology Map

9.3.3.3 Surface Water Flows

There are no OPW gauging stations located immediately downstream of the Site in either the Tralee Bay Feale or Blackwater (Munster) regional surface water catchments for which flow data is available (www.waterlevel.ie). Therefore, the EPA's hydrotool, available on www.catchments.ie, was consulted in order to estimate baseline flow volumes in the local area. The Hydrotool dataset contains estimates of naturalised river flow duration percentiles. Several nodes were consulted in the vicinity and downstream of the Site.

A 95 percentile (%ile) flow relates to the flow which will be exceeded within the river 95% of the time. For example, the 95%ile flow at Node 23_1040 on the Knockahorrea East stream (within the Feale_010 WFD river sub-basin) in the immediate vicinity of the Site is estimated to be 0.028m^3/s (28l/s). This indicates that 95% of the time, the flow at this location is estimated to be at or above 0.028m^3/s. The 95%ile flow at Node 23_1963 on the Glenacarney River is estimated to be 0.022m^3/s (22l/s). Due to the increased catchment size, the 95%ile flow at the nodes downstream along the River Feale are significantly larger. For example, at Node 21_160, the 95%ile flow in the River Feale is estimated to be 0.222m^3/s (222l/s). The progressively increasing flow volumes downstream of the Site are associated with the increased upstream catchment of the respective waterbodies. Figure 9-3 below presents the estimated flow duration curves for each of the consulted Hydrotool Nodes.

Within the Blackwater (Munster) catchment, flow volumes on the Glenlara River downstream of the Site are representative of a small local river with the 95%ile flow being 0.019m^3/s (19l/s) at Node 18_879. As seen in Figure 9-4, flow volumes are significantly larger in the Dalua River further downstream.

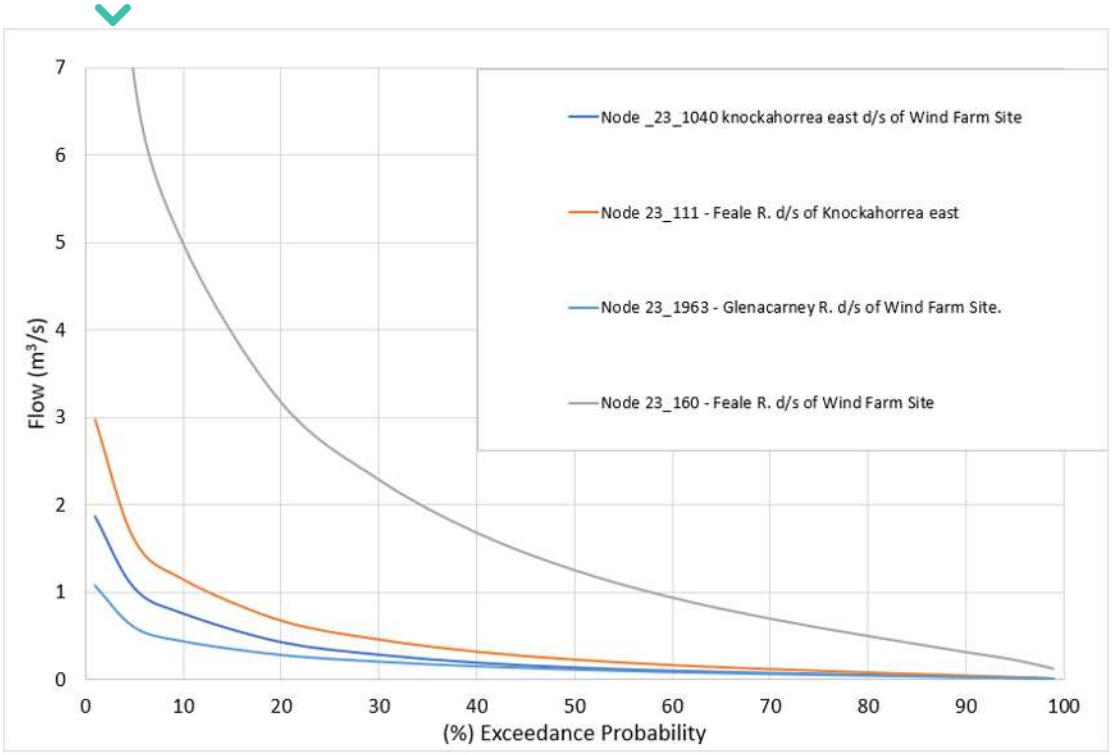


Figure 9-3: EPA HydroTool Node Flow Duration Curves in the Feale River Catchment

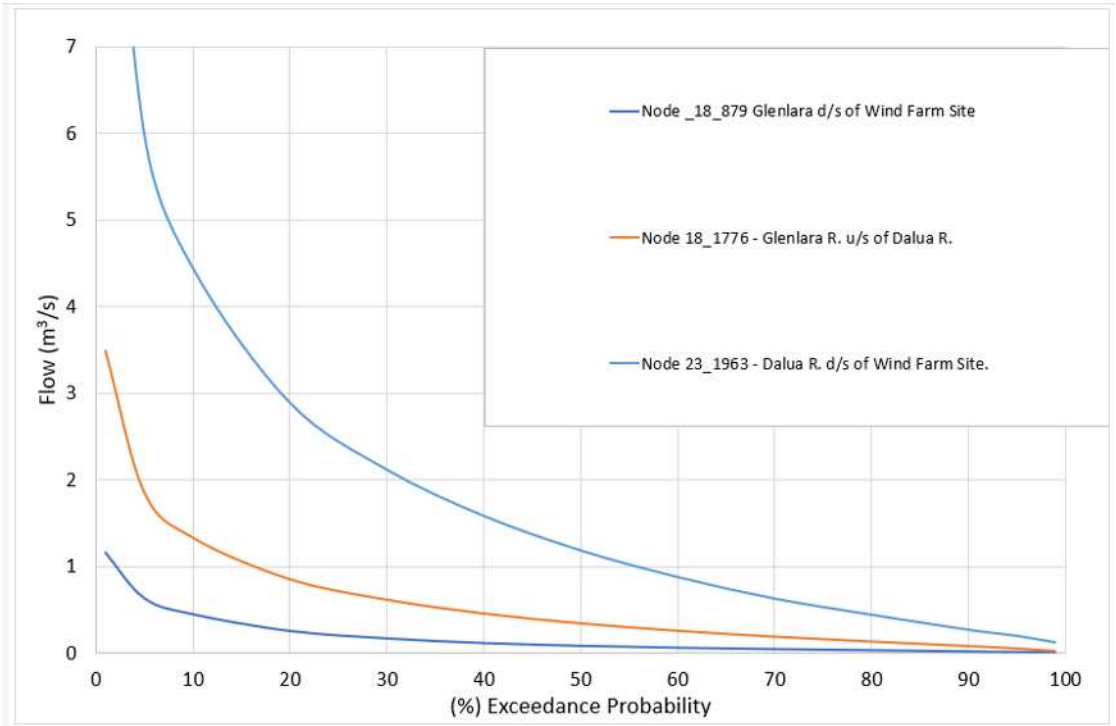


Figure 9-4: EPA HydroTool Node Flow Duration Curves in the Dalua River Catchment

9.3.4 Existing Site Drainage

9.3.4.1 Taurbeg Wind Farm

The topography of the Site is mountainous, with protruding ridges of bedrock outcrop. Ground elevations slope in all directions and range from ~302 to 405mOD. Due to the local topography, the

coverage of peat and low permeability of the underlying bedrock aquifer (refer to Section 9.3.7), the hydrology of the Site is characterised by a high density of surface water features.

The Site is drained by several 1st and 2nd order streams. Several natural watercourses originate within the Site and flow downslope before eventually discharging into the Feale River, to the north, and the Dalua River to the southeast. These watercourses include the Knockahorrea East stream in the east, the Glasheenanargid stream in the west and the Glenlara stream in the southeast

In places the natural drainage is further facilitated by a network of manmade drains. These manmade drains are concentrated within the areas of coniferous forestry and along sections of the existing wind farm access roads.

Several of the hardstand areas have adopted an "over the edge" drainage approach (where no drains are located alongside hardstand areas) in conjunction with sections of roadside drainage swales. Site drainage measures installed during the construction phase (i.e. silt traps settlement and ponds) have since been removed as the Site has naturally revegetated overtime.

The on-site roadways are constructed of permeable crushed stone and are cambered to direct runoff to roadside drains which run along the sides of the roads. This ensures that drainage channels have not formed on the roads, have not eroded the roadways and caused excessive sedimentation downstream. The roadside drains contain check-dams at regular intervals which reduce runoff rates. The roadside drains discharge to several outfall points which are designed in such a way that the natural hydrology of the area remained undisturbed.

Surface water flow monitoring (5 no. locations) of the main watercourses emerging from the Site were carried out on 2 no. occasions and this data is presented in Table 9-7 below. The locations of these monitoring points are shown on Figure 9-6. During the first monitoring round, the recorded flow volumes ranged from 1.5 to 3l/s which are typical of seasonal flows for 1st and 2nd order streams. Meanwhile, during the 2nd monitoring round, many of these upland streams contained little or no flow. No flow was recorded at SW1 or SW2a. For this reason, additional monitoring was completed at SW2b and SW5. The largest flow volume of ~10l/s was observed at SW5.

Table 9-7: Surface Water Flow Monitoring

Location	Round 1 (l/s) 26/03/2024	Round 2 (l/s) 14/08/2024
SW1	1.5	Dry
SW2a	Not included in Round 1	1.5
SW2b	1.5	Dry
SW3	2	0.5
SW4	3	0.5
SW5	Not included in Round 1	10

Within the Site there are also numerous manmade drains that are in place predominately to drain the local forestry plantations. The current internal forestry drainage pattern is influenced by the topography, peat subsoils, layout of the forest plantation and by the existing road network. The forest plantations, are generally drained by a network of mound drains which generally run perpendicular to the

topographic contours of the site and feed into collector drains, which discharge to interceptor drains down-gradient of the plantation.

Mound drains and ploughed ribbon drains are generally spaced approximately every 15m and 2m respectively. As illustrated in Figure 9-5 below, interceptor drains are generally located up-gradient (cut-off drains) and down-gradient of forestry plantations. Interceptor drains are also located up-gradient of forestry access roads. Culverts are generally located at stream crossings and at low points under access roads which drain runoff onto down-gradient forest plantations.

The forestry drains are the primary drainage routes towards the natural streams on the Site, but the flows in the higher elevated drains are generally very low or absent most of the time.

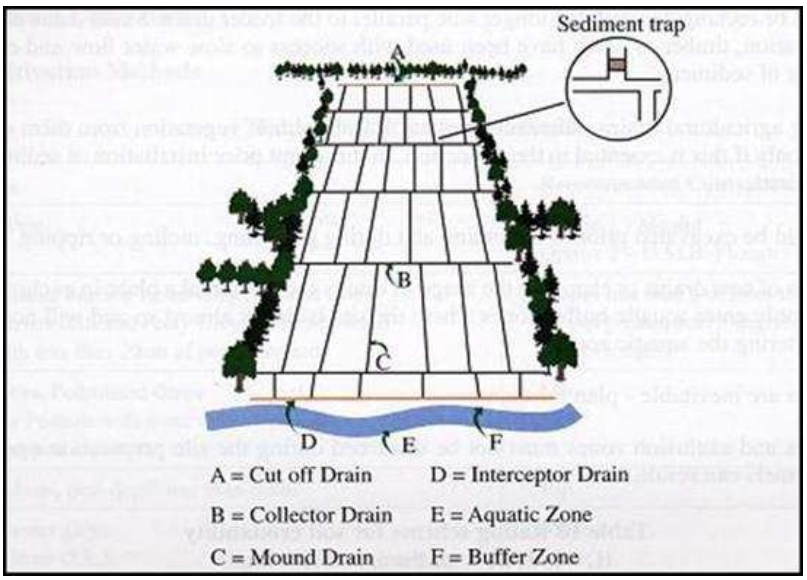


Figure 9-5: Schematic of Existing Forestry Drainage

9.3.4.2 Proposed Offsetting Measures

Proposed Offsetting Areas, 4 and the eastern section of Area 1 are drained by the Glengarriff River and its tributaries, one of which flows between Areas 1 and 4. Meanwhile, the western section of Area 1 and Area 2 are drained by the EPA named Fulacht Fia Coom stream which is a tributary of the Cloone River. These lands comprise of coniferous forestry plantations and are drained by typical forestry drainage consisting of mound and collector drains as detailed above and in Figure 9-5. The forestry drainage regime provides a direct hydrological linkage to the downstream natural watercourses.

Meanwhile, Area 3 is comprised of agricultural pastures. No significant drainage features were recorded in this area, with a manmade agricultural drain located along the northern boundary. This drain connects to the EPA named Knockatee stream to the west. No drain was noted along the southern boundary of Area 3 which is bounded by coniferous forestry.

9.3.5 Summary Flood Risk Assessment

9.3.5.1 Taurbeg Wind Farm

A Flood Risk Assessment of the Site has been carried out by HES, the findings of which are presented in full in Appendix 9-1 and are summarised below.

To identify those areas as being at risk of flooding, the OPW's Past Flood Events Maps, the National Indicative Fluvial Mapping, CFRAM River Flood Extents, historical mapping (i.e. 6" and 25" base

maps) and the GSI Groundwater Flood Maps were consulted. These flood maps are available to view at Flood Maps - Floodinfo.ie.

The OPW Past Flood Events Maps have no records of recurring or historic flood instances within the Site. Similarly, identifiable text on local available historical 6" or 25" mapping does not identify any lands that are "liable to flood".

Within the Tralee Bay Feale catchment the closest mapped historic flood event is ~5km downstream of the Site at the confluence of the Knockahorrea East stream and the Feale River at Rockchapel. This event was recorded in August 1986 (Flood ID: 2414).

Within the Blackwater (Munster) catchment, a recurring flood event is mapped ~7km downstream of the Site along the R578 on the Glenlara River, near its confluence with the Dalua River. According to the Area Engineer Notes for Newmarket, the R578 road flooding occurs along a stretch of ~1km, resulting from high flows in River Dalua (Flood ID: 5153).

The GSI Winter 2015/2016 Surface Water Flood Map shows surface water flood extents for this winter flood event. The Winter 2015/2016 flood event is recognised as being the largest flood event on record in many areas. The flood map for the Winter 2015/2016 flood event does not record any flood zones along the streams and watercourses which drain the Site.

CFRAM mapping has not been completed for the area of the Site. The closest CFRAM mapping to the Site has been completed along the Dalua River to the southeast of Newmarket town, ~11km southeast of the Site.

The National Indicative Flood Mapping (NIFM) for the Present Day Scenario shows flooding along the Knockahorrea East stream and the Glenacarney River in the Tralee Bay Feale catchment downstream of the Site. Fluvial flood zones are also mapped along the Owenkeal and Glenlara Rivers that drain the south of the Site. However, the medium (1% AEP, 1 in 100yr) and low (0.1% AEP, 1 in 1,000yr) probability flood zones do not encroach upon the Site. The Mid-Range and High-End scenarios model potential flood zones associated with climate change and an increase in rainfall of 20% and 30% respectively. These modelled flood zones do not differ significantly from the Present Day Scenario with flooding limited to the immediate vicinity of river channels.

Furthermore, the Site is not mapped within any historic or modelled groundwater flood zones.

The main risk of flooding at the Site is via pluvial flooding. This risk is limited to local flat areas within the Site due to the mountainous nature of the wider area. Surface water ponding/pluvial flooding may occur in some local flat areas due to the presence of low permeability peat at the surface. Mostly the risk of pluvial flooding is low.

In general, the risk of flooding at the Site is very low due to the elevated and sloping nature of the area and the high density of mountain streams which flow rapidly downslope. The existing wind farm drainage system, comprising of natural vegetation filter, interceptor drains, roadside drains and swales.

9.3.5.2 Proposed Offsetting Measures

With regards to the Proposed Offsetting lands, there is no text on local available historical 6" or 25" mapping and it does not identify any lands that are "liable to flood" in the local area. The OPW Past Flood Events Maps have no records of recurring or historic flood instances in the vicinity of the Proposed Offsetting lands. The GSI Winter 2015/2016 Surface Water Flood Map does not record any flood zones along the streams and watercourses which drain the Proposed Offsetting lands.

CFRAM mapping has not been completed for this area. The closest CFRAM mapping has been completed along the River Maine at Castleisland. Furthermore, no NIFM flood zones are mapped in the immediate vicinity of the Proposed Offsetting lands. The closest mapped flood zones are located

along the Glengarriff River (Clydagh River), ~900m downstream of the Proposed Offsetting lands, and along the Croaghane River, ~2.2km west of the Proposed Offsetting lands.

Furthermore, the Proposed Offsetting lands are not mapped within any historic or modelled groundwater flood zones.

The main risk of flooding at the Proposed Offsetting lands is via pluvial flooding. This risk is limited to local flat areas within the Site due to the mountainous nature of the wider area. Surface water ponding/pluvial flooding may occur in some local flat areas due to the presence of low permeability peat at the surface. Mostly the risk of pluvial flooding is low.

In general, the risk of flooding is very low.

9.3.6 Surface Water Quality

9.3.6.1 EPA Biological Q-Rating Data

9.3.6.1.1 *Taurbeg Wind Farm*

Biological Q-rating data for EPA monitoring points on the watercourses in the vicinity and downstream of the Site are shown in Table 9-8 below. The Q-Rating is a water quality rating system based on both the habitat and the invertebrate community assessment and is divided into status categories ranging from Q1 (Bad) to 4-5 (High).

Within the Tralee Bay-Feale Regional Surface Water Catchment Q-ratings are not available for the watercourses in the immediate vicinity of the Site. Further downstream at the bridge at Rockchapel (Station Code: RS23F010020), the River Feale achieved an EPA Q-rating of Q4 in the 2023 EPA monitoring round. Meanwhile, the Glenacarney River achieved a Q4-5 rating upstream of its confluence with the River Feale (Station Code: RS23G060300).

Within the Blackwater (Munster) Regional Surface Water Catchment, the Glenlara River achieved a Q3-4 rating in the 2020 EPA monitoring round, just upstream of its confluence with the Dalua River (Station Code: RS18G080500). Meanwhile, the Owenkeal River achieved a Q-rating of Q4-5 at Long Bridge upstream of its confluence with the Dalua River (Station Code: RS18O060600).

A map of local EPA monitoring stations is attached as Figure 9-6 below.

Table 9-8: Latest EPA Water Quality Monitoring Q-Rating Values (2020-2022) Downstream of the Site

Watercourse	Station ID	Easting	Northing	Year	EPA Q-Rating Status
Tralee Bay-Feale catchment					
Feale River	RS23F010020	122000	115914	2023	Q4 (Good)
Glenacarney River	RS23G060300	119114	114914	2020	Q4-5 (High)
Blackwater (Munster) catchment					
Glenlara River	RS18G080500	129880.24	107460.81	2020	Q3-4 (Moderate)
Owenkeal River	RS18O060600	129820.73	104865.69	2020	Q4-5 (High)

9.3.6.1.2 *Proposed Offsetting Measures*

Biological Q-rating data for EPA monitoring points on the watercourses in the vicinity and downstream of the Proposed Offsetting lands are shown in Table 9-9 below.

Within the Laune-Maine-Dingle Bay, the Croaghane River achieved a Q-rating of Q4 in 2022 at Sheheree Bridge (Station Code: RS22C090100). Further downstream, the Shanowen River also achieved a Q4 rating downstream of the confluence Croaghane and Cloone rivers (Station Code: RS22S010020).

Meanwhile, within the Tralee Bay-Feale Regional Surface Water Catchment the Clydagh River achieved a Q4-5 rating at Scalp Bridge (Station Code: RS23C030200) in 2023. Further downstream and upstream of its confluence with the Feale River, the Clydagh River achieved a Q4 rating (Station Code: RS23C030500).

Table 9-9: Latest EPA Water Quality Monitoring Q-Rating Values (2020-2022) Downstream of the Proposed Offsetting Lands

Watercourse	Station ID	Easting	Northing	Year	EPA Q-Rating Status
Laune-Maine-Dingle Bay					
Croaghane River	RS22C090100	106366	109827	2022	Q4 (Good)
Shanowen	RS22S010020	105463	108955	2022	Q4 (Good)
Tralee Bay-Feale					
Clydagh	RS23C030200	112022	114614	2023	Q4-5 (High)
Clydagh	RS23C030500	113705	119999	2023	Q4 (Good)

9.3.6.2 Historical Water Quality Monitoring

No surface water sampling was conducted at the time of the original planning application and therefore, comparisons to the pre-construction baseline water quality at the Site is not possible.

Furthermore, there is no routine surface water quality monitoring carried out for the operational Taurbeg Wind Farm.

9.3.6.3 Contemporary Water Quality Monitoring

Field hydrochemistry measurements of unstable parameters, electrical conductivity (µS/cm), pH (pH units) and temperature (°C) along with turbidity (NTU) were taken at 4 no. surface water sampling locations over 2 no. monitoring rounds completed on 26th March and 14th August 2024 within surface watercourses draining and directly downstream of the Site. The results are listed in Table 9-10. The monitoring locations were typically in small mountainous streams and the monitoring locations are shown in Figure 9-6 below.

Note that during the August monitoring round no flow was recorded at SW2a or SW1. Therefore, the sampling was moved further downstream to SW2b and SW5 respectively.

Electrical conductivity values at the monitoring locations ranged between 81 and 149µS/cm, with an average conductivity value of 112µS/cm. Turbidity ranged from 1.8 to 10.4NTU. The highest turbidity value of 10.4NTU was recorded at SW3 on 14th August 2024. Dissolved Oxygen ranged from 8.4 to 10.5mg/l. The pH values were generally slightly basic, ranging between 7.8 and 8.9, with an average pH of 8.3.

Table 9-10: Field Parameters - Surface Water Chemistry Measurements (26/03/2024 and 14/08/2024)

Location ID	Temp °C	DO (mg/l)	SPC (µS/cm)	pH	Turbidity (NTU)
SW1	12.3	8.7	114	7.8	4.9
SW2	10.8 – 12.9	8.4 – 8.5	123 - 149	7.9 – 8.2	1.8 - 2.7
SW3	10.9 - 11.7	10.1 - 10.5	81 - 95	8.3 - 8.5	3.4 - 10.4
SW4	11.7 – 15.5	9.2 - 9.3	101 - 116	8.1 - 8.9	3.8 – 4.3
SW5	13.7	10	119	8.6	2.2

Surface water grab samples were also taken at these locations for laboratory analysis. Results of the laboratory analysis are shown alongside relevant water quality regulations in Table 9-11 and Table 9-12 below. Original laboratory reports are attached as Appendix 9-2.

Suspended solid concentrations ranged from <5 to 55mg/l. Suspended solid concentrations were below the S.I 293 (of 1988) threshold limit of 25 mg/l in 7 of the 8 no. samples. The 1 no. exceedance was recorded at SW3 on 14th August 2024. This exceedance occurred as there was very little flow in this stream during this sampling event and sediment at the bottom of the streambed was disturbed during the sampling. Note that the suspended solids concentration at this monitoring location was <5mg/l in the previous monitoring round undertaken on 26th March 2024. Therefore, the exceedance at SW3 can be attributed to disturbance of the streambed during the sampling and is not reflective of naturally high concentrations of suspended solids in this watercourse.

Ammonia was found to be at or below the level of detection of the laboratory (0.02mg/l) in 7 of the 8 no. samples. There was only 1 no. exceedance of the threshold value for High status (≤0.04 mg/l) as set out in SI 272 of 2009. All samples were below the Good status threshold value of ≤0.065mg/l.

BOD ranged between <1 and 2 mg/l. A total of 5 no. samples were of High status (≤1.3mg/l) while 3 no. samples exceeded the good status threshold value of ≤1.5mg/l. The 3 no. exceedances with respect to BOD were recorded on 26th March 2024. This sampling event was preceded by very heavy rainfall which may have contributed to elevated BOD concentrations. Note that BOD achieved 'High' status at all sampling locations in the subsequent sampling (14th August 2024).

Nitrate concentrations were found to be below the level of detection of the laboratory in 7 no. samples. Meanwhile, chloride concentrations ranged from 5.3 to 18.4mg/l.

Table 9-11: Laboratory Results (26/03/2024)

Location ID	Suspended Solids (mg/l)	BOD_5 (mg/l)	Orthophosphate (mg/l)	Nitrate (mg/l NO_3)	Ammonia (mg/l)	Chloride (mg/l)
EQS	**≤25([2])**	**≤ 1.3 to ≤ 1.5([3])**	**-≤ 0.035 to ≤0.025([2])**	**-**	**-≤0.065 to ≤ 0.04([2])**	-
SW1	<5	2	<0.02	<5	0.02	9.2
SW2a	<5	2	<0.02	5.6	<0.02	5.3
SW3	<5	1	<0.02	<5	0.02	5.8
SW4	<5	2	<0.02	<5	0.02	9.5

Table 9-12: Laboratory Results (14/08/2024)

Location ID	Suspended Solids (mg/l)	BOD_5 (mg/l)	Orthophosphate (mg/l)	Nitrate (mg/l NO_3)	Ammonia (mg/l)	Chloride (mg/l)
EQS	**≤25([4])**	**≤ 1.3 to ≤ 1.5([5])**	**-≤ 0.035 to ≤0.025([2])**	**-**	**-≤0.065 to ≤ 0.04([2])**	-
SW2b	<5	<1	0.04	<5	0.06	18.4
SW3	55	<1	<0.02	<5	<0.02	11.5
SW4	17	<1	<0.02	<5	<0.02	14
SW5	<6	<1	<0.02	<5	0.02	14.7

[2] *S.I. No. 293/1988: European Communities (Quality of Salmonid Waters) Regulations*

[3] *S.I. No. 272/2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 (as amended by S.I. No. 296/2009; S.I. No. 386/2015; S.I. No. 327/2012; and S.I. No. 77/2019 and giving effect to Directive 2008/105/EC on environmental quality standards in the field of water policy and Directive 2000/60/EC establishing a framework for Community action in the field of water policy).*

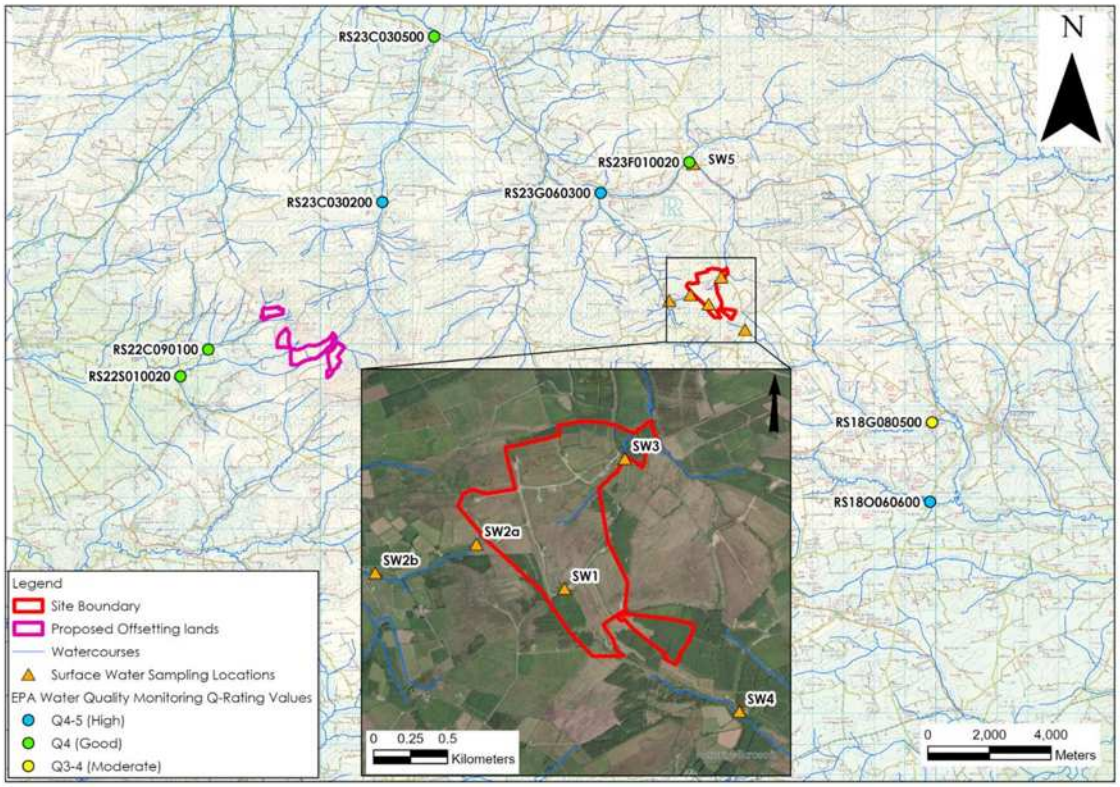


Figure 9-6: Map of EPA Monitoring Stations and HES Sampling Locations

9.3.7 Hydrogeology

9.3.7.1 Taurbeg Wind Farm

The bedrock geology underlying the Site is mapped by the GSI as comprising of Namurian shales in the north and Namurian sandstones in the south. The bedrock is classified by the GSI as being a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones (www.gsi.ie). A bedrock geology aquifer map is attached as Figure 9-7.

The majority of the Site, including 10 no. existing turbines, is underlain by the Abbeyfeale Groundwater Body (GWB) which is characterized by poorly productive bedrock. The Site is located on the southeastern margin of this GWB. According to the GSI's GWB Characterisation Report, the Abbeyfeale GWB is comprised of rocks that are devoid of intergranular permeability; groundwater flow occurs in fractures and faults. Generally, groundwater levels are 0-6 m below ground level, and follow the topography. Shallow groundwater flow paths are short (30-300 m), with groundwater discharging to the streams and small springs. Artesian conditions and deep inflow levels indicate that there are lower parts of the aquifer that are confined by low permeability layers in the rock succession. Due to the shallow groundwater flow in this aquifer the groundwater and surface waters are closely linked.

Meanwhile, the south of the Site is underlain by the Rathmore West GWB which is also characterised by poorly productive bedrock. This GWB is also comprised of rocks with low transmissivity and storativity. Flow occurs along fractures, joints and major faults. Flows in the aquifer are generally concentrated in a thin weathered zone at the top of the rock. Due to the low permeability of the rock and the sloping topography, a high proportion of effective rainfall will runoff and discharge rapidly to surface watercourses.

Based on observations at the Site, groundwater baseflow contribution to local streams is expected to be very low all year round. This is due to low groundwater recharge rates and the localised groundwater flow pattern below the peat.

Overall, the hydrology of the Site is dominated by surface water runoff on the bog surface and within the existing drainage channels.

9.3.7.2 Proposed Offsetting Measures

The Proposed Offsetting lands are mapped by the GSI to be underlain by Namurian Shales and Namurian Sandstones. These rocks are classified by the GSI as being a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones.

In terms of GWBs, the eastern areas are underlain by the Abbeyfeale GWB (described above). Meanwhile, the western areas are underlain by the Scartaglin GWB which is characterised by poorly productive bedrock.

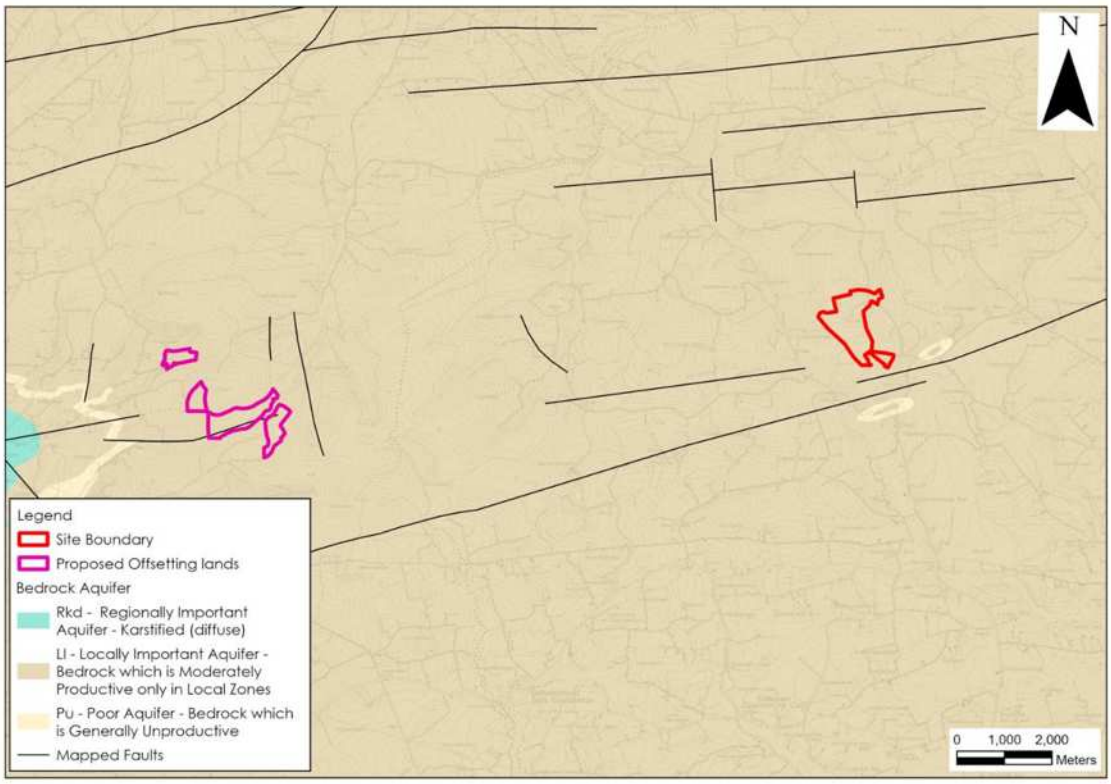


Figure 9-7: Bedrock Geology Aquifer Map

9.3.8 Groundwater Vulnerability

9.3.8.1 Taurbeg Wind Farm

The GSI describe groundwater vulnerability as a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability embodies the characteristics of the intrinsic geological and hydrogeological features at a site that determine the ease of groundwater contamination. Groundwater vulnerability is related to recharge acceptance, whereby in areas where recharge occurs more readily, a higher quantity of contaminants will have access to groundwater.

The mapped vulnerability rating of the bedrock aquifer underlying the Site ranges from Low to Extreme. The areas of Extreme vulnerability are mapped in areas where rock is mapped at or near the ground surface, typically in the vicinity of watercourses. Groundwater vulnerability is mapped as Moderate across the majority of the Site due to the presence of peat soils and subsoils. Based on the site investigations completed at the Site, the depth to rock ranged from 0.86 and 5.1mbgl, with the

soils/subsoils comprising of low permeability peat and clay. Therefore, based on site-specific data, the groundwater vulnerability at the Site ranges from Extreme to Moderate in accordance with Table 9-13.

However, due to the low permeability nature of the Namurian bedrock aquifer underlying the existing wind farm site, groundwater flowpaths are likely to be short (30 – 300m), with recharge emerging close by at seeps and surface streams. This means there is a low potential for groundwater dispersion and movement within the aquifer, therefore local surface watercourses are more vulnerable (to contamination from human activities) than groundwater in this area.

Table 9-13: Groundwater Vulnerability and Subsoil Permeability and Thickness (www.gsi.ie)

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 - 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

9.3.8.2 Proposed Offsetting Measures

The Proposed Offsetting lands are mapped in areas of Moderate to Extreme groundwater vulnerability. However, due to the low permeability of the underlying bedrock, and the dominance of low permeability peat soils/subsoils, local watercourses are more vulnerable in this area.

9.3.9 Groundwater Hydrochemistry

9.3.9.1 Taurbeg Wind Farm

There are no groundwater quality data for the Site and groundwater sampling would not be undertaken for an existing wind farm, as groundwater quality impacts are extremely unlikely. There are also no wastewater discharges to ground as all wastewater (at the control/substation building) is contained in a holding tank and removed from the Site.

The WFD status for the Abbeyfeale and Rathmore West GWBs in terms of water quality is 'Good' and therefore this is assumed to be the baseline condition for groundwater in the Site.

The GSI's Initial Characterisation Report for the Abbeyfeale GWB (GSI, 2004) states that no hydrochemical data is currently available for this GWB. Groundwaters sampled in the adjacent Ballylongford GWB are moderately hard (120-270 mg/l $CaCO_3$) and have moderate alkalinities (170-240 mg/l $CaCO_3$). Measured electrical conductivity ranges from ~440-560 µS/cm.

The GSI's Initial Characterisation Report for the Rathmore West GWB (GSI, 2004) states that groundwater emanating from the Namurian rocks is generally slightly hard, with an average total hardness of about 110 mg/l. There are variable water type classifications, varying from calcium-magnesium-sodium bicarbonate to sodium bicarbonate, reflecting the high ion exchange capacity of the rocks The main groundwater quality problems due to the natural conditions in the ground and the natural chemistry of groundwater are caused by iron (Fe). A high proportion of wells in the Namurian

rocks have high iron concentrations (more than 20 mg/l (total Fe) in places) and to a lesser extent manganese (Mn) (up to 0.53 mg/l).

9.3.9.2 Proposed Offsetting Measures

There is no groundwater quality data for the Proposed Offsetting lands and groundwater sampling would not be undertaken due to the shallow nature of the proposed works.

9.3.10 Water Framework Directive Water Body Status & Objectives

The River Basin Management Plan was adopted in 2018 and has amalgamated all previous river basin districts into one national river basin management district. The Water Action Plan 2024 is Ireland's third River Basin Management Plan and it outlines the measures the Government and other sectors are taking to improve water quality in Ireland's groundwater, rivers, lakes, estuarine and coastal waters, and provides sustainable management of our water resources. The Water Action Plan 2024 enhances and builds upon the work of the first and second-cycle plans. The Water Action Plan objectives, include the following:

- Ensure full compliance with relevant EU legislation;
- Prevent deterioration
- Meet the water standards and objectives for designated protected areas;
- Protect high-status waters; and,
- Implement targeted actions and pilot schemes in focused sub-catchments aimed at (i) targeting waterbodies close to meeting their objectives and (ii) addressing more complex issues that will build knowledge for future cycles.

Our understanding of these objectives is that surface waters, regardless of whether they have 'Poor' or 'High' status, should be treated the same in terms of the level of protection and mitigation measures employed, i.e. there should be no negative change in status at all. Furthermore, any development must not in any way prevent a waterbody from achieving at least good status by 2027.

Strict mitigation measures (refer to Section 9.5.2 and 9.5.3) in relation to maintaining a high quality of surface water runoff from the development and groundwater protection will ensure that the status of both surface water and groundwater bodies in the vicinity of the Site will be at least maintained (see below for WFD water body status and objectives) regardless of their existing status.

9.3.11 Groundwater Body Status

Local Groundwater Body (GWB) and Surface Water Body (SWB) status reports are available for view from (www.catchments.ie).

The Abbeyfeale and Rathmore West GWBs achieved 'Good' status in all 3 no. WFD cycles (2010-2015, 2013-2018 and 2016-2021) (refer to Table 9-14). In terms of risk status, these GWBs have been deemed to be 'not at risk' of failing to meet their respective WFD objectives. No pressures have been identified for the GWBs underlying the Site.

Furthermore, the Scartaglin GWB underlying the western section of the Proposed Offsetting lands achieved "Good" status in all 3 no. WFD cycles. This GWB is also "not at risk" and no significant pressures have been identified.

Table 9-14: WFD Groundwater Body Status (Site and Proposed Offsetting Lands)

GWB	Overall Status 2010-2015	Overall Status 2013-2018	Overall Status 2016-2021	3rd Cycle Risk Status	WFD Pressures
Abbeyfeale	Good	Good	Good	Not at risk	None
Rathmore West	Good	Good	Good	Not at Risk	None
Scartaglin	Good	Good	Good	Not at risk	None

9.3.12 Surface Water Body Status

9.3.12.1 Taurbeg Wind Farm

A summary of the WFD status and risk result for Surface Water Bodies (SWBs) in the vicinity and downstream of the Site are shown in Table 9-15 below.

As stated above, the vast majority of the Site is located in the Tralee Bay-Feale surface water catchment. The Feale_010 SWB which drains the majority of the Site achieved 'High' status in the latest WFD cycle (2016-2021). This was an improvement on 'Good' status which this SWB achieved in the previous cycles. The Glenacarney_010 SWB drains the northwest of the Site and this SWB is of 'Good' status. Further downstream the Feale_020 and Feale_030 SWBs also achieved 'Good' status in all 3 no. WFD cycles.

In terms of risk status these SWBs have been deemed to be 'not at risk' of failing to meet their respective WFD objectives. No significant pressures have been identified to be impacting these SWBs.

The south of the Site is located in the Munster (Blackwater) surface water catchment. In this area of the site the Owenkeal_010 SWB achieved 'Good' status in the last 2 no. WFD cycles (2013-2018 and 2016-2021). Note that no infrastructure associated with the existing Taurbeg Wind Farm is located in the Owenkeal_010 WFD river sub-basin. Meanwhile, 1 no. turbine is mapped in the Glenlara_010 river sub-basin. This SWB achieved 'Moderate' status in all 3 no. WFD cycles. Further downstream the Dalua_020 and Dalua_030 SWBs are of 'Good' status.

In terms of risk status the Dalua_020 and Owenkeal_010 SWBs are 'not at risk'. The Glenlara_010 and Dalua_030 SWBs are deemed to be 'at risk' of failing to meet its WFD objectives. The Glenlara_010 SWB has been identified to be under significant pressure to the forestry activities and hydromorphological stresses while the Dalua_030 SWB has been identified to be under other pressures.

Table 9-15: Summary WFD Information for Surface Water Bodies Downstream of the Site

River Waterbody	Status 2010-2015	Status 2013-2018	Status 2016-2021	3rd Cycle Risk Status	WFD Pressures
Tralee Bay-Feale Catchment					
Feale_010	Good	Good	High	Not at risk	None
Glenacarney_010	Good	Good	Good	Not at risk	None
Feale_020	Good	Good	Good	Not at risk	None
Feale_030	Good	Good	Good	Not at risk	None
Blackwater (Munster) Catchment					
Owenkeal_010	High	Good	Good	Not at risk	None
Glenlara_010	Moderate	Moderate	Moderate	At risk	Forestry & Hydromorphology
Dalua_020	Good	Good	Good	Not at risk	None
Dalua_030	Good	Good	Good	At risk	Other

9.3.12.2 Proposed Offsetting Measures

Within the Laune-Maine-Dingle Bay regional surface water catchment, the Shanowen (Maine)_010 SWB in the vicinity of the Proposed Offsetting lands achieved "Good" status in all 3 no. WFD cycles. Further downstream the Maine_010 SWB achieved 'Moderate' status in the latest WFD cycle (2016-2021). This was a deterioration from the 'Good' status which this SWB achieved previous WFD cycles. The Maine_010 SWB is deemed to be at risk of failing to meet its WFD objectives and is listed as being under significant pressure from hydromorphological impacts.

Within the Tralee Bay-Feale regional surface water catchment, the Clydagh (Feale)_010 and _020 SWBs downstream of the Proposed Offsetting lands achieved 'High' status in the latest WFD cycle (2016-2021). This was an improvement in status from the 'Good' status which these SWBs achieved in the 2013-2018 cycle. These SWBs are not at risk of failing to meet their WFD objectives. A summary of the WFD status and risk result for Surface Water Bodies (SWBs) in the vicinity and downstream of the Proposed Offsetting lands are shown in Table 9-16 below.

Table 9-16: Summary WFD Information for Surface Water Bodies Downstream of the Proposed Offsetting Lands

River Waterbody	Status 2010-2015	Status 2013-2018	Status 2016-2021	3rd Cycle Risk Status	WFD Pressures
Tralee Bay-Feale Catchment					
Clydagh (Feale)_010	Good	Good	High	Not at risk	None
Clydagh (Feale)_020	Moderate	Good	High	Not at risk	None
Laune-Maine-Dingle Bay					
Shanowen (Maine)_010	Good	Good	Good	Not at risk	None
Maine_010	Good	Good	Moderate	At risk	Hydromorphology

9.3.13 Designated Sites and Habitats

9.3.13.1 Taurbeg Wind Farm

Within the Republic of Ireland, designated sites include Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).

The Site is located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (Site Code: 004161). All of the existing infrastructure apart from the existing wind farm site entrance, T7 and T6, are mapped within this SPA. This SPA is designated due to the presence of Hen Harrier.

Within the Tralee Bay-Feale surface water catchment, the Lower River Shannon SAC (Site Code: 002165) is located downstream of the Site via the Knockahorrea East Stream. The length of the hydrological pathway between the Site and the SAC is ~2.2km. The Lower River Shannon SAC is designated due to the presence of several water dependent species and habitats which are listed in Annex I/II of the E.U. Habitats Directive.

Within the Blackwater (Munster) surface water catchment the Blackwater River (Cork/Waterford) SAC (Site Code: 002170) is located downstream of the Site. The length of the hydrological flowpath between the Site and the SAC is ~6.5km via the Glenlara River. The Blackwater River (Cork/Waterford) SAC is designated due to the presence of several water dependent species and habitats which are listed in Annex I/II of the E.U. Habitats Directive.

There are no other designated sites within 5km of the Site.

A map of local designated sites is attached as Figure 9-8 below.

9.3.13.2 Proposed Offsetting Measures

The Proposed Offsetting lands are also mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This SPA is a very large site centred on the borders between Cork, Kerry and Limerick. The SPA consists of a variety of upland habitats, through almost half is afforested. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier. It is a conservation objective to restore the extent and quality of both open heath and bog habitats within the SPA as these habitats can provide important nesting and foraging resources.

The Proposed Offsetting lands are also located immediately adjacent to the Mount Eagle Bogs NHA (Site Code: 002449). This NHA consists of four areas of blanket big adjacent to Mount Eagle and includes the summits of Mount Eagle, Knockfeha and Knockanefune. The Proposed Offsetting lands are located topographically downgradient of this NHA (no surface water connections via rivers or streams existing between the Proposed Offsetting lands and this NHA).

Within the Tralee Bay-Feale regional surface water catchment, the Proposed Offsetting lands are also located immediately upstream of the Lower River Shannon SAC (Site Code: 002165), the length of the hydrological flowpath between the Proposed Offsetting lands and the SAC is ~2km along the Glengarriff River.

Within the Laune-Maine-Dingle Bay regional surface water catchment, the Proposed Offsetting lands are located ~28km northeast (straight line distance) of the Castlemaine Harbour SAC (Site Code: 000343).

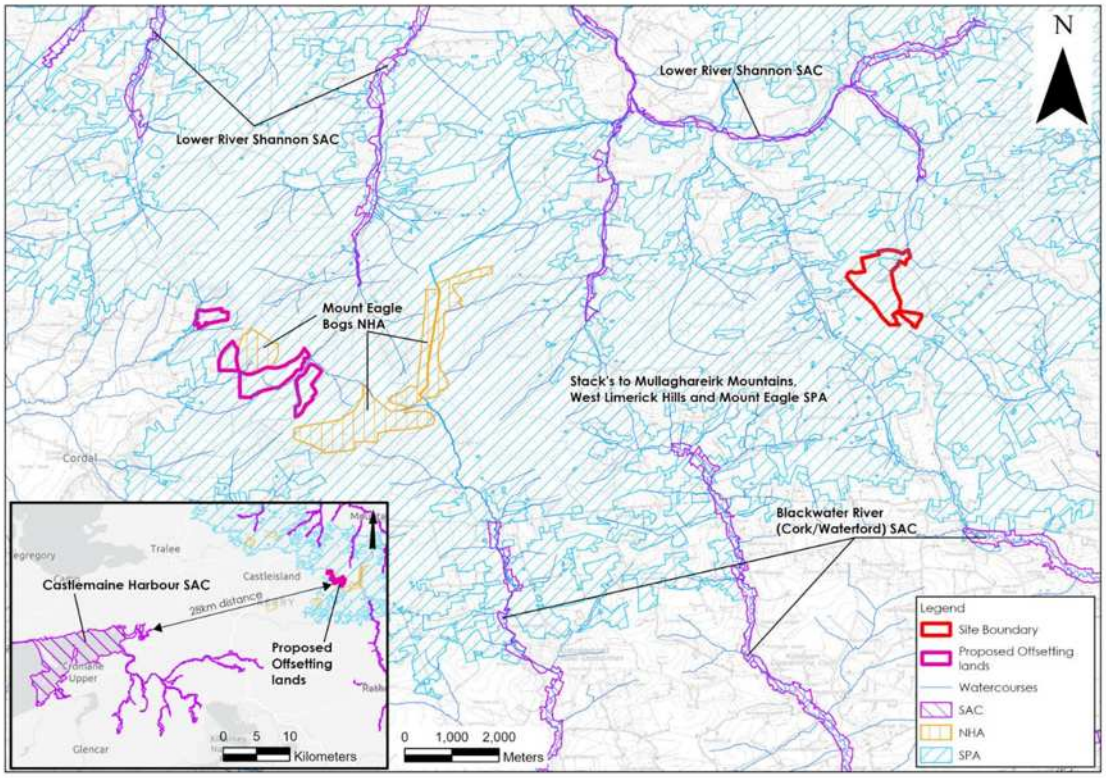


Figure 9-8: Designated Sites

9.3.14 Water Resources

9.3.14.1 Groundwater Resources

9.3.14.1.1 *Taurbeg Wind Farm*

The GSI do not map the presence of any registered Group Water Schemes (GWS) or Public Water Schemes (PWS) or associated source protection areas within the Site (www.gsi.ie).

There are no PWS or GWS within 10km of the Site. The closest mapped GWS is the Kileedy GWS. The source protection area associated with this GWS is mapped ~11km to the northeast of the Site.

A search of private well locations (wells with location accuracy of 1–100m were only sought) was undertaken using the GSI well database (www.gsi.ie). 2 no. wells (GSI Name: 1111SWW041 and 1111SWW040) are located to the northeast of the Site in the townland of Glennakeel South. These wells are mapped ~1.4 and 1.9km northwest of T3 and are listed as having agricultural and domestic uses. According to the GSI (www.gsi.ie) these wells have a moderate yield class of 16.4m^3/day.

A map of local wells identified by the GSI is attached as Figure 9-9.

9.3.14.1.2 *Proposed Offsetting Measures*

There are no PWS or GWS in the vicinity of the Proposed Offsetting lands. The GSI map several local private wells/boreholes in the lands to the west of the Proposed Offsetting lands. These wells are used for agricultural and domestic purposes and are listed as having a poor to moderate yield class.

9.3.14.2 Surface Water Resources

9.3.14.2.1 *Taurbeg Wind Farm*

The closest downstream surface water abstraction in the Tralee Bay -Feale surface water catchment is located on the Feale River (Feale_050 DWPA – Drinking Water Protected Area). This Uisce Éireann abstraction is for the Abbeyfeale Public Water Supply. It is ~20km downstream of the Site, and it has an estimated maximum abstraction volume of ~3,010m^3/day.

Meanwhile, within the Blackwater (Munster) surface water catchment the closest downstream surface water abstraction point is located in the Blackwater River downstream of Mallow (Blackwater (Munster)_150) SWB. This abstraction is for Uisce Éireann's Zone 4 Mallow Scheme. It is ~52km downstream of the Site, and it has an estimated maximum daily abstraction rate of ~453m^3/day.

9.3.14.2.2 Proposed Offsetting Measures

The Clydagh (Feale)_020 SWB downstream of the Proposed Offsetting lands is listed as a DWPA. According to the EPA, abstraction register this DWPA is associated with the Brosna/Knocknagoshel PWS which has an estimated maximum daily abstraction rate of 1,806m^3/day. The length of the hydrological flowpath between the Proposed Offsetting lands and this SWB is ~5km along the Glengarriff River.

There are no surface water abstractions located downstream of the Proposed Offsetting lands in the Laune-Maine-Dingle Bay regional surface water catchment.

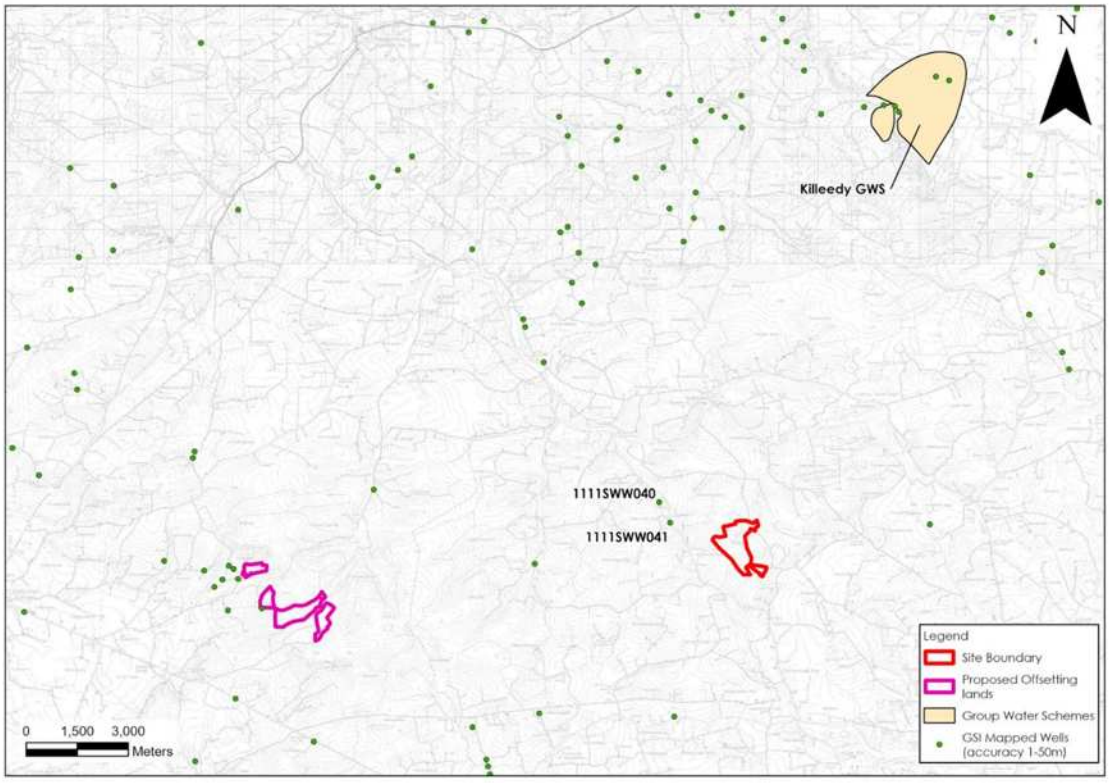


Figure 9-9: Map of Groundwater Wells (www.gsi.ie)

9.3.15 Receptor Sensitivity

The greatest potential for impacts on the hydrological and hydrogeological environment associated with wind farm developments occurs during the construction phase of the development as this is the phase when earthworks and excavations would be undertaken. However, there are no construction requirements associated with the Proposed Lifetime Extension and therefore the risk to downstream sensitive receptors is significantly reduced.

The primary risks to the water environment during the extended operational phase are from hydrocarbon spillage/leakages along with surface water runoff and potential erosion issues (sediment entrainment) arising from the existing hardstand areas.

Similar potential impacts can occur on all developed sites including industrial, commercial and farmyards. All potential contamination sources are to be carefully managed at the Site during the Proposed Lifetime Extension and mitigation measures are proposed below (Section 9.5) to deal with these minor potential effects.

With regards to the potential impacts associated with the Proposed Offsetting Measures, due to the near surface nature of the activities (i.e. deforestation and restoration of farmland) effects on groundwater are generally negligible and surface water is the main sensitive receptor to be assessed. The primary risk to groundwater at the Proposed Offsetting lands would be from hydrocarbon spillage and leaks. This is a common potential effect on all construction/forestry sites. The greatest risk to surface waters will come from elevated concentrations of suspended sediment and nutrient releases during deforestation. Comprehensive surface water mitigation and controls are detailed to ensure the protection of all downstream receiving waters.

9.3.15.1 Aquifers/Groundwater Bodies

The Proposed Lifetime Extension maintenance works have the potential to contaminate groundwaters with hydrocarbons being used at the Site. The following sensitive groundwater receptors are identified for impact assessment associated with the Proposed Lifetime Extension:

- The Locally Important Aquifers underlying the Site. These aquifers can be considered to be of Medium Importance in accordance with Table 9-3;
- The WFD status of the GWBs (Abbeyfeale and Rathmore West GWBs) underlying the Site; and,
- The local private groundwater abstractions in the lands surrounding the Site.

Additionally, the following receptors are identified for impact assessment associated with the Proposed Offsetting Measures:

- The Locally Important Aquifers underlying the Proposed Offsetting lands, and;
- The WFD status of the GWBs (Abbeyfeale and Scartaglin GWBs) underlying the Proposed Offsetting lands.

9.3.15.2 Surface Waters

Surface waters are the main sensitive receptors associated with the Proposed Project due to the local hydrological regime which is characterised by high runoff rates and low rates of groundwater recharge.

The quantification of flow volumes presented in Section 9.3.4.1 indicates that the watercourses in the immediate vicinity of the Site will be most susceptible to potential effects. The larger regional waterbodies such as the Allow River in the Blackwater (Munster) surface water catchment and the Feale River in the Tralee Bay-Feale surface water catchment will be less susceptible to effects due to the larger flow volumes and the associated dilution effect of these increased flows. The potential for effects to occur will decrease progressively further downstream of the Site.

The following surface water receptors are identified for impact assessment associated with the Proposed Lifetime Extension:

- The local surface waters downstream of the Site in the Tralee Bay-Feale surface water catchment, including the Glenacarney and Knockahorrea East tributaries of the

Feale. These watercourses can be considered to be of Very High Importance based on their Q-ratings (refer to Table 9-2); and,
- The WFD status of the SWBs in the vicinity and downstream of the Site.

The downstream surface water abstractions along the River Feale at Abbeyfeale and the River Blackwater at Mallow have been screened out of the impact assessment due to the length of the hydrological pathways between these drinking water protected areas and the Site (~20km and ~52km respectively). Furthermore, the increasing volumes of water within the Feale and Blackwater rivers will provide a significant dilution effect. There is no potential for the Proposed Lifetime Extension to impact these surface water abstractions.

With regards to the Proposed Offsetting Measures, the following surface water receptors are identified for impact assessment:

- The local surface watercourses downstream of the Proposed Offsetting lands including the Glengarriff River in the Tralee Bay-Feale surface water catchment and the Shanowen River in the Laune-Maine-Dingle Bay surface water catchment; and,
- The WFD status of these SWBs in the vicinity and downstream of the Proposed Offsetting lands.

Furthermore, the downstream abstraction on the Clydagh (Feale)_020, associated with the Brosna/Knocknagoshel PWS, will be included in the impact assessment as this DWPA is located ~5km downstream of the Proposed Offsetting lands.

9.3.15.3 Designated Sites

The Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA will be included in the impact assessment as the Site is located within this designated site. Whilst the SPA does not contain any water-dependent qualifying interest, deterioration in the water environment may impact the overall condition of the SPA.

The only other designated sites with the potential to be affected by the Proposed Project are located downstream of the Site along the Glenlara River and the tributaries of the Feale River (i.e. Knockahorrea East stream and the Glenacarney River).

Based on the above, the following designated sites are identified for impact assessment associated with the Proposed Lifetime Extension:

- Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA;
- Lower River Shannon SAC; and,
- Blackwater River (Cork/Waterford) SAC.

Furthermore, the following designated sites are identified for impact assessment associated with the Proposed Offsetting Measures:

- Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA;
- Mount Eagle Bogs NHA; and,
- Lower River Shannon SAC;

9.4 Characteristics of the Proposed Project

Planning permission is being sought for the Proposed Lifetime Extension of Taurbeg Wind Farm as permitted by Cork County Council under planning regulation ref N/2002/3608, for a further period of 10 years from the date of expiry (2026) as per Condition no. 7 of the original planning consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Project is described in full in Chapter 4 of this EIAR and related to the extended operation of all elements of the existing wind farm and the enhancement and management of lands for the purposes of hen harrier mitigation.

There are no alterations proposed to the existing wind farm infrastructure, therefore, there are no requirements for construction works or reinstatement works for the Proposed Lifetime Extension.

Typically, daily operational phase maintenance traffic will consist of four-wheel drive vehicles or vans with no off-road requirements.

During the Proposed Lifetime Extension, occasionally vehicles or plant may be necessary for maintenance of access roads, drainage networks and hardstands along with some minor landscaping works.

Small amounts of granular material may be imported to maintain access tracks and hardstands during the Proposed Lifetime Extension which will place intermittent minor demand on local quarries.

The Proposed Offsetting lands consist of 4 no. parcels of land proposed for hen harrier habitat creation, 3 in the townland of Coom (Areas 1, 2 and 4) and 1 no. further north in the townland of Knockatee (Area 3). It is proposed to permanently remove c. 105.5 hectares of plantation forestry which will create more biodiverse upland habitats suitable for foraging hen harrier. Approximately 10ha of this land will be permanently removed offsite, with the remaining 95.5 ha of felled material being stacked into windrows on site. Regarding the farmland area (c.17.7 ha), this land will be permanently restored for the benefit of hen harrier through restoration measures such as planting and restoring of hedgerow, implementation of a rotational grazing scheme, linear wildlife crop sowing, cease on fertiliser application and predator fencing. The total area of the Proposed Offsetting lands is ~123.2ha. Full details of the Proposed Offsetting Measures are also outlined in Chapter 4 and Appendix 7-7.

9.5 Likely Significant Effects and Associated Mitigation Measures

9.5.1 Do -Nothing Scenario

If the Proposed Project were not to proceed, the existing Taurbeg Wind Farm will be decommissioned, as per the existing permission.

During decommissioning of the wind farm, it is intended to limit groundworks other than to rehabilitate constructed areas such as turbine bases and hardstanding areas. This will be done by covering with topsoil to encourage vegetation growth and reduce run-off and sedimentation. The turbines will be removed and transported off-site and the turbine concrete bases will remain in the ground and backfilled.

A Decommissioning Plan is proposed as part of the Proposed Lifetime Extension. This is presented in Appendix 4-3 of this EIAR.

With regards to the Proposed Offsetting lands, areas 1, 2 and 4 would continue to function as a coniferous forestry plantation and would be felled and replanted several times in the future. Area 3 would continue as agricultural land.

9.5.2 Proposed Offsetting Measures - Likely Significant Effects and Mitigation Measures

There are no proposed construction works associated with the Proposed Lifetime Extension.

The only works associated with the Proposed Project relate to the Proposed Offsetting Measures. These works are assessed in terms of their potential to impact the hydrological and hydrogeological environment below.

9.5.2.1 Potential Effects from Deforestation of Coniferous Plantation

Deforestation is a component of the Proposed Offsetting Measures with ~105.5ha of coniferous forestry proposed for deforestation.

Potential effects during deforestation occur mainly from:

- Exposure of soil and subsoils due to vehicle tracking, compaction and skidding or forwarding extraction methods resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses;
- Entrainment of suspended sediment in watercourses due to vehicle tracking through watercourses;
- Damage to forest roads resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses;
- Release of sediment attached to timber in stacking areas; and,
- Nutrient release.

These effects have the potential to affect the water quality and fish stocks of downstream water bodies. Potential effects on all watercourses downstream of the Proposed Offsetting lands could be significant if not mitigated.

Pathways: Drainage and surface water discharge routes.

Receptors: Surface water quality in rivers and streams draining the Proposed Offsetting lands including the Glengarriff River, the Cloone River and the Croaghane River and associated dependent ecosystems.

Pre-Mitigation Potential Effect: Negative, significant, indirect, temporary, likely effect on surface water quality and dependent aquatic ecosystems.

Proposed Mitigation Measures:

Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that deforestation and other forestry operations result in minimal potential negative effects to the receiving environment. These mitigation measures are tried and tested, best practice mitigation measures which are implemented at forestry sites across the country. The guidance documents include:

- Forestry Standards Manual (Forest Service, 2015)
- Environmental Requirements for Afforestation (Forest Service, 2016a)
- Land Types for Afforestation (Forest Service, 2016b)
- Forest Protection Guidelines (Forest Service, 2002)
- Forest Operations and Water Protection Guidelines (Coillte, 2013)
- Forestry and Water Quality Guidelines (Forest Service, 2000b)
- Forestry and the Landscape Guidelines (Forest Service, 2000c)
- Forestry and Archaeology Guidelines (Forest Service, 2000d)
- Forest Biodiversity Guidelines (Forest Service, 2000e)
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018)
- Coillte Planting Guideline SOP
- A Guide to Forest Tree Species Selection and Silviculture in Ireland (Horgan et al., 2003)
- Management Guidelines for Ireland's Native Woodlands. Jointly published by the National Parks & Wildlife Service (Cross and Collins, 2017)
- Native Woodland Scheme Framework (Forest Service, 2018)
- Code of Best Forest Practice (Forest Service, 2000)

Mitigation by Avoidance:

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" will be implemented during the deforestation activities.

The following buffer zones will be implemented:

- No disturbance to ground will occur within 5m of a relevant watercourse or within 10-20m for aquatic zones.
- In areas of higher sensitivity or where silt movement is more likely this zone will increase to 20m;
- In these sensitive areas, there will be no machines crossing any natural watercourse;
- Refuelling and maintenance of machines will occur at least 50m from watercourses. It is proposed that refuelling will only be completed at the existing entrance to Area 2. This location is distant from any watercourses;
- Use natural buffer zones to filter water from mound drains;
- Short, stepped mound drains to be used in moderately sloped areas; and,
- No drainage on very steep slopes, within delineated aquatic or buffer zones.

The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:

- Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment;
- Avoid peat/soil disturbance and compaction within close proximity to surface watercourses;
- Avoid the entry of suspended sediment from works into watercourses; and,
- Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

In addition to the application of buffer/setback zones, the following supplementary mitigation measures will be employed during deforestation works:

Mitigation by Design:

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:

- The deforestation coupes are carefully planned to ensure no unnecessary water crossings will be required.
- Machine combinations will be chosen which are most suitable for ground conditions at the time of deforestation, and which will minimise soils disturbance. The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines;
- All machinery will be operated by suitably qualified personnel;
- Checking and maintenance of forest roads and culverts will be on-going through any deforestation operations. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during deforestation works;
- These machines will traverse the site along specified off-road routes (referred to as brash mats);
- The location of brash mats will be chosen to avoid wet and potentially sensitive areas;
- Brash mats will be placed to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- Silt fences will be installed at the outfalls of existing drains downstream of deforestation areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any deforestation works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;
- In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during the Proposed Offsetting works;
- Double silt fencing will also be put down slope of deforestation areas which are located in close proximity to streams and/or relevant watercourses;
- Drains and silt traps will be maintained throughout all deforestation works, ensuring that they are clear of sediment build-up and are not severely eroded;

- Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites;
- Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff;
- Refuelling will occur at a designated refuelling area at the existing entrance to Area 2. This refuelling area is remote from all watercourses. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and,
- Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.

Deforestation will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.

Drain Inspection and Maintenance:

The following items shall be carried out during inspection before deforestation and after:

- Communication with forestry operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines;
- Inspection of all areas reported as having unusual ground conditions;
- Inspection of main drainage ditches and outfalls. During inspections prior to deforestation, the main drainage ditches shall be identified. Ideally the inspection shall be carried out during rainfall;
- Following deforestation, all main drains shall be inspected to ensure that they are functioning;
- Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;
- Culverts on drains exiting the site will be unblocked; and,
- All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.

Surface Water Quality Monitoring:

In line with standard forestry practice, and in combination with the above, grab sampling will be completed at additional sampling locations downstream of deforestation areas before, during (if the operation is conducted over a protracted time) and after the deforestation activity. The 'before' sampling should be conducted within 4 weeks of the deforestation activity, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many sampling events as necessary to demonstrate that water quality has returned to pre-activity status (*i.e.* where an effect has been shown).

Criteria for the selection of water sampling points include the following:

- Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses;
- Select sampling points upstream and downstream of the forestry activities;
- It is advantageous if the upstream location is outside/above the forest in order to evaluate the effect of land-uses other than forestry;
- Where possible, downstream locations should be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no effect through dilution effect or

contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and,
- The above sampling strategy will be undertaken for all on-site sub-catchments streams where deforestation is proposed.

Post Mitigation Residual Effects: Deforestation operations pose a risk to surface water quality in downstream receptors due to the release of suspended sediments and nutrient enrichment. Proven and effective measures to mitigate the risk of releases of sediment have been proposed above and will break the pathway between the potential sources and the receptor. The residual effect is considered to be - Negative, imperceptible, indirect, temporary, unlikely effect on downstream water quality and aquatic habitats.

Significance of Effects: For the reasons outlined above, and with the implementation of the listed mitigation measures, no significant effects on the surface water quality will occur.

9.5.2.2 Potential Effects from Deforestation and Nutrient Release to Surface Waters

The afforestation of the Proposed Offsetting lands would have required an initial one-off application of a phosphate based fertiliser when the trees were replanted. Phosphate application was required due to the presence of peat soils which are strongly acidic and contain low levels of available nutrients. In these acidic soils, phosphorus is one of the major limiting factors of primary productivity and phosphate, typically in the form of rock phosphate, is applied when the trees are planted to ensure that the plantations have sufficient phosphorous for sustainable growth. Typically, only one application of the phosphate is required, as once the trees are growing phosphate recycles naturally and run-off is not an issue. Total phosphorus may increase in response to fertiliser applications, but such increases are temporary and have no impact on downstream river ecological status.

However, deforestation operations disrupt the forestry nutrient cycle and there is the potential for phosphorous to be released into downstream watercourses resulting in nutrient enrichment i.e. eutrophication.

Following deforestation, there are 2 sources of phosphorus. Firstly, phosphorus is released from the forest floor and root system, due to needle decomposition and disruption to nutrient cycling by the trees. The second source is the brash material that is left on site, as it degrades and leaches into adjoining watercourses.

Therefore, the proposed deforestation operations have the potential to release nutrients into nearby watercourses which will have a potential negative short-term impact on downstream surface water quality.

Pathways: Drainage and surface water discharge routes.

Receptors: Surface water quality in rivers and streams draining the Proposed Offsetting lands including the Glengarriff River, the Cloone River and the Croaghane River and associated dependent ecosystems.

Pre-Mitigation Potential Effect: Negative, significant, indirect, short-term, likely effect on surface water quality and dependent aquatic ecosystems.

Proposed Mitigation Measures:

The most effective way to manage deforestation and the potential risks to water quality is to implement a strict and best practice mitigation system when carrying out the deforestation operations.

Best practice, tried and tested methods provided in the EIAR relate to water incorporated into the forestry management and water quality protection measures were derived from:

- Forestry Commission (2003) Forests and Water Guidelines, Fourth Edition. Publ. Forestry Commission, Edinburgh;
- Coillte (2009) Forest Operations & Water Protection Guidelines;
- Coillte (2009) Methodology for Clear Felling Harvesting Operations;
- Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford; and,
- Forest Service, (2000): Code of Best Forest Practice – Ireland. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.

As stated above in Section 9.5.2.1, mitigation measures from best practice Forestry Service Guidelines along with the Freshwater Pearl Mussel (FPM) requirements will be applied and will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses. These measures are set out above. The FPM presence also requires that the project site is independently assessed prior to work commencement.

The primary mitigation measures in relation to phosphorus are the implementation of aquatic buffer zones.

Phosphorus is highly mobile, and studies have shown that phosphorus is absorbed quickly by riparian buffer zones which are effective in mitigating against phosphorus runoff following deforestation. It is well established forestry best practice to implement vegetative buffer zones adjacent to watercourses, allowing the vegetation in the buffer zone to absorb the phosphorous before it enters the watercourse.

Impact Assessment:

The mitigation measures set out above will not completely prevent the release of nutrients to downstream watercourses. The release of phosphate into the environment is an unavoidable consequence of deforestation. However, the Proposed Offsetting Measures, will remove a significant source of nutrients at the Proposed Offsetting lands (i.e. the existing commercial forestry). This will have a positive long-term effect with regards to nutrient concentrations in local and adjacent watercourses.

Post Mitigation Residual Effects: Deforestation operations pose a risk to surface water quality in downstream receptors due to nutrient enrichment. Best practice measures, including the implementation of riparian buffer zones, will help protect surface water quality throughout the Proposed Offsetting Measures however nutrient release is an unavoidable consequence of deforestation. The short-term residual effect is considered to be - negative, indirect, slight to moderate, likely effect on downstream water quality and aquatic habitats. As stated above, the Proposed Offsetting Measures only propose 1 no. round of deforestation in comparison to the Do Nothing Scenario in which the Proposed Offsetting lands would be felled and replanted several times. Therefore, the long-term residual effect is considered to be - positive, indirect, moderate, likely effect on downstream water quality and aquatic habitats.

Significance of Effects: For the reasons outlined above, and with the implementation of the listed mitigation measures, no significant effects on the surface water quality will occur.

9.5.2.3 Potential Effects from the Release of Hydrocarbons

Accidental spillage during refuelling of construction plant with petroleum hydrocarbons can cause significant pollution risk to groundwater, surface water and associated aquatic ecosystems, and to terrestrial ecology. In addition, the accumulation of small spills of fuels and lubricants during routine plant use can also be a pollution risk. Hydrocarbons have a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. It is also a nutrient supply for adapted micro-

organisms, which can rapidly deplete dissolved oxygen in waters, resulting in the death of aquatic organisms.

Pathway: Groundwater flowpaths and site drainage network.

Receptor: Surface water quality in rivers and streams draining the Proposed Offsetting lands including the Glengarriff River, the Cloone River and the Croaghane River and associated dependent ecosystems and local groundwater quality.

Pre-Mitigation Potential Effect: Negative, indirect, slight, short term, likely effect on local groundwater quality in the peat bog. Indirect, negative, significant, short-term, unlikely effect to surface water quality.

Proposed Mitigation Measures:

There will be no fuels or herbicides stored within 50m of an aquatic zone or within 20m of all other water features.

- All vehicles will be refuelled at a designated refuelling location at the existing entrance to Area 2;
- This on-site refuelling will be undertaken using a double skinned bowser with spill kits kept on site for accidental leakages or spillages;
- The bowser will be refilled by the fuel truck and absorbent materials and pads will be available in the event of accidental spillages;
- Only designated trained operatives will be authorised to refuel plant at the designated refuelling station;
- Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system;
- Fuels storage will be minimised. All storage areas will be bunded appropriately for the duration of the Proposed Offsetting Measures. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area;
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- The plant used during Proposed Offsetting Measures will be regularly inspected for leaks and fitness for purpose; and,
- An emergency response plan for the Proposed Offsetting Measures to deal with accidental spillages will be contained within the Operational Environmental Management Plan.(OEMP).

Post Mitigation Residual Effect: The potential for the release of hydrocarbons to groundwater and watercourse receptors is a risk to surface water and groundwater quality, and also the aquatic quality of the surface water receptors. Proven and effective measures to mitigate the risk of releases of hydrocarbons have been proposed above and will break the pathway between the potential source and each receptor. The residual effect is considered to be - Negative, imperceptible, indirect, temporary, unlikely effect on groundwater quality within the peat bog and surface water quality in down-gradient rivers.

Significance of Effects: For the reasons outlined above, and with the implementation of the listed mitigation measures, no significant effects on surface water or groundwater quality will occur.

9.5.2.4 Potential Effects on Designated Sites

The Proposed Offsetting lands are located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. It is recognised that the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA does not contain any designated water dependent species/habitats, However, any deterioration in water quality could impact the overall environment

within the SPA and for this reason, the SPA has been included in the water impact assessment. Furthermore, within the Tralee Bay Feale regional surface water catchment, the Proposed Offsetting lands are hydrologically connected with the Lower River Shannon SAC (Site Code: 002165) via the Glengarriff River (length of this hydrological flowpath is ~2km). The River Shannon SAC contains several water dependent species and habitats.

The Proposed Offsetting Measures aims to permanently remove c. 105.5 ha of commercial forestry and restore c. 17.7 ha of farmland habitat both for the benefit of hen harrier. During the Proposed Offsetting Measures, and in the absence of mitigation measures, there may be a short-term negative impact on water quality within the SPA and the downstream SAC associated with the proposed deforestation and the potential water quality effects associated with such works (entrainment of suspended solids in surface waters, nutrient release and the accidental release of hydrocarbons). However, once the deforestation works have been completed, the Proposed Offsetting Measures will have a positive effect on downstream surface water quality associated with the removal of nutrient sources (coniferous trees) and the return to a more natural drainage regime.

Mount Eagles Bogs NHA is also located immediately adjacent to the Proposed Offsetting areas 1 and 4. The NHA is located topographically upgradient of the Proposed Offsetting lands, and there is no potential for surface water quality effects. However, given the close proximity of the works to the NHA, any disturbance to the local hydrological/hydrogeological regime would have the potential to impact the NHA (i.e. peat water levels in the NHA).

Pathway: Surface water flowpaths.

Receptor: Down-gradient water quality in local rivers including the Glengarriff River (Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA and the Lower River Shannon SAC). Bog/Peat water levels in the lands adjoining the Proposed Offsetting lands including the Mount Eagle Bogs NHA.

Pre-Mitigation Potential Effect: Negative, significant, indirect, short-term, likely effect on downstream designated sites (Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA and Lower River Shannon SAC). Negative, slight, indirect, short-term, likely effect on local bog hydrogeology including the bogs comprising the Mount Eagle Bog NHA.

Impact Assessment / Mitigation Measures:

Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA

The Proposed Offsetting Measures will have no potential to significantly affect the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA for the following reasons:

- The SPA does not contain any water dependent species or habitats – it is designated for Hen Harrier;
- The Proposed Offsetting Measures target replacing forestry and agricultural lands with lands suitable for hen harrier which is in line with the conservation objectives of the SPA;
- The proposed works comprise of deforestation and detailed mitigation measures have been prescribed to protect surface water quality during deforestation operations are outlined in Sections 9.5.2.1 and 9.5.2.2; and,
- Furthermore, detailed mitigation measures for the control of hydrocarbons during deforestation works are outlined in Section 9.5.2.3.

Lower Shannon SAC

The Proposed Offsetting Measures will have no potential to affect the Lower Shannon SAC for the following reasons:

- The proposed works comprise of deforestation and detailed mitigation measures have been prescribed to protect surface water quality during deforestation operations are outlined in Sections 9.5.2.1 and 9.5.2.2;
- Furthermore, detailed mitigation measures for the control of hydrocarbons during deforestation works are outlined in Section 9.5.2.3; and,
- The length of the hydrological connection (~1.8km) between the Site and the Lower River Shannon SAC.

Mount Eagle Bogs NHA

- Detailed mitigation measures to protect surface water quality during deforestation operations are outlined in Sections 9.5.2.1 and 9.5.2.2;
- Detailed mitigation measures for the control of hydrocarbons during deforestation works are outlined in Section 9.5.2.3;
- No significant excavation works or earthworks are proposed which would dewater the bogs adjoining the Proposed Offsetting lands.

Implementation of these best-practice and tried and tested mitigation measures will ensure the protection of water quality in receiving waters.

At this point it is also worth reiterating that whilst the Proposed Offsetting Measures do involve deforestation of ~105.5ha of forestry, deforestation will only occur on 1 no. occasion and no replanting and subsequent deforestation will occur. There will only be 1 no. mitigated release of nutrients associated with deforestation at the Proposed Offsetting lands. In the case of the Do-Nothing Scenario, whereby these lands would continue to function as a coniferous plantation with numerous cycles of felling and replanting in the future, there would be several nutrient release events. Therefore, by limiting the number of deforestation events at the Proposed Offsetting lands, and with the implementation of the prescribed best practice mitigation measures, the Proposed Offsetting will have a long-term positive effect on downstream water quality with regard to future nutrient concentrations.

Poat Mitigation Residual Effects: Activities at the Proposed Offsetting lands pose a threat to designated sites hydrologically linked with the Proposed Offsetting lands. Proven and effective measures to mitigate the risk of surface and groundwater contamination have been proposed which will break the pathway between the potential source and the downstream receptor. These mitigation measures will ensure that surface water runoff from the Proposed Offsetting lands will be equivalent to baseline conditions and will therefore have no effect on the status or ecology of the protected species and habitats within any designated site. The residual effect is considered to be Negative, imperceptible, indirect, short term, unlikely effect on designated sites including the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, Lower River Shannon SAC and Mount Eagle Bogs NHA.

Significance of Effects: For the reasons outlined above, no significant effects on any designated sites will occur.

9.5.2.5 Potential Effects on Downstream Surface Water Abstractions

Within the Tralee Bay Feale regional surface water catchment, the Proposed Offsetting lands are hydrologically connected with the Clydagh (Feale)_020 DWPA via the Glengarriff River (flowpath length of ~5km). Any potential water quality effects (entrainment of suspended solids in surface waters, nutrient release and the accidental release of hydrocarbons) could potentially affect this water supply.

Pathway: Surface water flowpaths.

Receptor: Clydagh (Feale)_020 DWPA.

Pre-Mitigation Potential Effect: Indirect, negative, slight, temporary, likely effect on the Clydagh (Feale)_020 DWPA.

Impact Assessment / Mitigation Measures:

No significant effects will occur for the following reasons:

- Detailed mitigation measures to protect surface water quality during deforestation operations are outlined in Sections 9.5.2.1 and 9.5.2.2;
- Detailed mitigation measures for the control of hydrocarbons during deforestation works are outlined in Section 9.5.2.3; and,
- The length of the hydrological flowpath between the Proposed Offsetting lands and the DWPA which is ~5km in length.

The implementation of these best practice mitigation measures during the Proposed Offsetting Measures will ensure that there are no effects on the downstream surface water abstraction.

Post Mitigation Residual Effects: Activities at the Proposed Offsetting lands pose a threat to downstream surface water abstractions hydrologically connected with the Proposed Offsetting lands. Proven and effective measures to mitigate the risk of surface and groundwater contamination have been proposed which will break the pathway between the potential source and the downstream receptor. These mitigation measures will ensure that surface water runoff from the Proposed Offsetting lands will be equivalent to baseline conditions and will therefore have no effect on downstream surface water abstractions. The residual effect is considered to be Negative, imperceptible, indirect, short term, unlikely effect on the Clydagh (Feale)_020 DWPA.

Significance of Effects: For the reasons outlined above, no significant effects on any designated sites will occur.

9.5.2.6 Potential Effects on WFD Status

The EU Water Framework Directive (2000/60/EC) requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027 at the latest. Any new development must ensure that this fundamental requirement of the Directive is not compromised.

The WFD status for GWBs and SWBs underlying and downstream of the Proposed Offsetting lands are defined in Section 9.3.11 and Section 9.3.12.2 respectively.

A detailed WFD Compliance Assessment Report has been completed in combination with this EIAR Chapter and is included in Appendix 9-3.

Pathway: Surface water flowpaths.

Receptor: WFD status of downstream surface water bodies and underlying GWBs.

Pre-Mitigation Potential Effect: Indirect, negative, imperceptible, short term, likely effect on surface water and groundwater bodies.

Proposed Mitigation Measures:

Mitigation measures relating to the protection of surface water drainage regimes and surface water quality within the Proposed Offsetting lands have been detailed in Section 9.5.2.1 (deforestation), Section 9.5.2.2 (nutrient release) and Section 9.5.2.3 (hydrocarbons).

Similarly, mitigation measures for the protection of groundwater quantity and quality have been detailed in Section 9.5.2.3 (hydrocarbons). No impacts on groundwater quantity/levels will occur due to the surface nature of the Proposed Offsetting Measures.

The implementation of these best practice mitigation measures during the Proposed Offsetting works will ensure the qualitative and quantitative status of the receiving surface waters will not be altered by the Proposed Offsetting Measures.

Post-Mitigation Residual Effects: Mitigation for the protection of surface and groundwater during the Proposed Offsetting works will ensure the qualitative and quantitative status of the receiving waters will not be significantly altered by the Proposed Offsetting Measures.

There will be no change in GWB or SWB status in the underlying GWB or downstream SWBs resulting from the Proposed Offsetting Measures. There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWB and downstream SWBs are protected from any potential deterioration.

No residual effect on GWB WFD status will occur.

No residual effect on SWB WFD status will occur.

As such, the Proposed Offsetting Measures are compliant with the requirements of the Water Framework Directive (2000/60/EC).

Significance of Effects: For the reasons outlined above, no significant effects on WFD GWB and SWB status, risk or future objectives will occur as a result of the Proposed Offsetting Measures.

9.5.2.7 Potential Effects on Downstream Flood Risk

The current forestry drainage system in the Proposed Offsetting lands (Areas 1, 2 and 4) was designed to lower the local peat water table in order to facilitate forestry activities within these areas. Meanwhile, no significant drainage features were recorded in Area 3 with an agricultural field drain located along the northern boundary of this area.

The Proposed Offsetting Measures comprise the permanent removal of c. 105.5 ha of coniferous plantation forestry and the restoration of c.17.7 ha of farmland for the benefit of hen harrier. No further works such as drain blocking or re-wetting of peatland are proposed which would have the potential to alter the existing hydrological regime. The proposed deforestation and farmland restoration works do not include the alteration of the existing hydrological regimes which will remain undisturbed and there will be no increase in the downstream flood risk.

Pathways: Water volume, and flow volumes in local watercourses.

Receptors: Downstream properties.

Pre-Mitigation Potential Effect: Negligible effect on downstream flood risk.

Mitigation Measures:

No specific mitigation measures are required in relation to downstream flood risk. The Proposed Offsetting Measures do not include drain blocking or any other measures which would alter the existing hydrological regime.

All Proposed Offsetting Measures will be done in accordance with 'best practice' procedures and the mitigation measures in relation to the protection of surface and groundwater quality are detailed elsewhere.

Post Mitigation Residual Effect: No effect on the downstream flood risk.

Significance of the Effect: For the reasons outlined above, we consider that the Proposed Offsetting Measures will not have a significant effect on the downstream flood risk.

9.5.3 Extended Operational Phase – Likely Impacts and Mitigation Measures

9.5.3.1 Potential Hydromorphological and Flood Risk Effects due to Increased Site Runoff Potential

Replacement of the peat or vegetated surface with less permeable surfaces can potentially result in an increase in the volume or flow rate of surface water runoff reaching the surface water drainage network. This may have potentially increased runoff from the Site thereby potentially negatively affecting hydromorphology and flood risk downstream of the development. A quantified assessment of this risk is presented below.

In reality, the existing access roads and hardstand areas have a higher permeability than the underlying peat. However, it is conservatively assumed in this assessment that the access roads and hardstands are fully impermeable.

During storm rainfall events, additional runoff coupled with increased velocity of flow could increase hydraulic loading, resulting in erosion of watercourses and impact on aquatic ecosystems.

However, visual inspections on watercourses carried out as part of this EIAR assessment identified no notable erosion or hydromorphological effects within the Site.

Pathway: Site drainage network.

Receptor: Surface waters (Glenlara River, Glenacarney River and the Knockahorrea East stream) and water-dependent ecosystems.

Pre-Mitigation Potential Effect: Negative, imperceptible, indirect, long term, likely effect on downstream surface watercourses.

Effects Assessment / Mitigation Measures

The below calculations are carried out for the month with the highest average recorded rainfall (i.e. January) versus evapotranspiration, for the current baseline site conditions, in terms of hardstand coverage. Refer back to Section 9.3.6 for Greenfield site runoff estimates.

The presence of the total development footprint associated with the Taurbeg Wind Farm (total 3.76 ha) results in an average total site increase in surface water runoff of approximately 185m^3/month.

This represents a potential increase of approximately 0.1% in the average daily/monthly volume of runoff from the site area in comparison to the Greenfield pre-development site runoff conditions (refer to Table 9-17).

This is a very small increase in average runoff and results from the naturally high surface water runoff rates and the relatively small area of the site developed, the total development footprint being ~3.76ha, representing ~3% of the Site Boundary area of 112ha.

Table 9-17: Greenfield Site Runoff V Development Runoff

Site Baseline Runoff/wettest month (m^3)	Baseline Runoff/day (m^3)	Permanent Hardstanding Area (m^2)	Hardstanding Area 100% Runoff (m^3)	Hardstanding Area 96% Runoff (m^3)	Net Increase/month (m^3)	Net Increase/day (m3)	% Increase from Baseline Conditions (m^3)
146,720	4,733	33,700	4,852	4,650	202	6.5	0.1

The small additional volume is very low due to the fact that the runoff potential from the Site is naturally high (94%). Also, the calculation assumes that the hardstanding areas are impermeable which is not the case as they are constructed of permeable stone aggregate.

The increase in runoff from the Site (in comparison to the Greenfield pre-development site conditions) is therefore imperceptible and no additional drainage mitigation is proposed above what is already present as outlined below:

- Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff;
- Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation;
- Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters;
- The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk.

Post Mitigation Residual Effects: With the implementation of the existing drainage measures as detailed above, and based on the existing hydrological regime at the Site, we consider that residual effects are - Negative, imperceptible, direct, long-term, likely effect on all downstream surface water bodies.

Significance of Effects: No significant effects on downstream flood risk or hydromorphology will occur during the Proposed Lifetime Extension.

9.5.3.2 Potential Effects from Runoff Resulting in Suspended Solids Entrainment in Surface Waters

During the Proposed Lifetime Extension, some minor maintenance works may be completed, such as maintenance of site entrance, internal roads and hardstand areas. These works would be of a very minor scale and would be very infrequent. Potential sources of sediment laden water would only arise from surface water runoff from small areas where new material is added during maintenance works.

These minor activities could, however, result in a brief release of suspended solids to surface water and could result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Potential effects are not likely to be significant even if not mitigated against.

Pathways: Drainage and surface water discharge routes.

Receptors: Down-gradient watercourses (Glenlara River, Glenacarney River and the Knockahorrea East stream) and associated water-dependent ecosystems.

Pre-Mitigation Potential Effect: Negative, slight, indirect, brief, likely effect on downstream surface watercourses.

Mitigation Measures:

The existing drainage measures (as outlined in Section 9.3.5 above) have been effective in removing any silt generated during routine maintenance works. This has been reflected in the surface water sampling conducted at the site.

In addition to the above, temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock.

Temporary blocking of drains downstream of works area can also be undertaken if roadside swales are absent.

Post Mitigation Residual Effects: With the implementation of the existing wind farm drainage measures as outlined above, along with some additional temporary control measures, we consider that residual effects are - negative, imperceptible, indirect, long term, likely effect on downstream water quality.

Significance of Effects: For the reasons outlined above, no significant effects on the surface water quality will occur.

9.5.3.3 Potential Effects from the Release of Hydrocarbons

Accidental spillage during refuelling of plant and equipment with petroleum hydrocarbons is a significant pollution risk to groundwater, surface water and associated ecosystems, and to terrestrial ecology. The accumulation of small spills of fuels and lubricants during routine plant use can also be a pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. It is also a nutrient supply for adapted micro-organisms, which can rapidly deplete dissolved oxygen in waters, resulting in death of aquatic organisms.

However, due to the small volumes of oils and fuels that will be present on-site during the Proposed Lifetime Extension in the form of a fuel truck, no significant effects will occur.

Pathway: Groundwater flowpaths and site drainage network.

Receptor: Groundwater (Abbeyfeale and Rathmore West GWBs) and surface watercourses (Glenlara River, Glenacarney River and the Knockahorrea East stream).

Pre-Mitigation Potential Effect:

Indirect, negative, slight, short term, likely effect to local groundwater quality.

Indirect, negative, moderate, short term, likely effect to surface water quality.

Proposed Mitigation Measures:

Any plant and equipment used during the Proposed Lifetime Extension will require refuelling during the works. Appropriate management of fuels will be required to ensure that incidents relating to refuelling are avoided. The following mitigation measures are proposed to avoid release of hydrocarbons at the site:

- Road-going vehicles will be refuelled off site wherever possible;
- On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required;
- Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;
- Fuel volumes stored on site will be minimised. Any fuel storage areas will be bunded appropriately for the fuel storage volume;
- The plant used will be regularly inspected for leaks and fitness for purpose;
- An emergency plan for the extended operational phase to deal with accidental spillages will be developed. Spill kits will be available to deal with accidental spillage in and outside the refuelling area;
- A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the lifetime extension; and,
- Adherence to Operational and Environmental Management Plan (refer to Appendix 4-2 of the EIAR).

Post Mitigation Residual Effect: The potential for the release of hydrocarbons to groundwater and surface water receptors is a risk to surface water and groundwater quality, and also the aquatic quality of the surface water receptors. Proven and effective measures to mitigate the risk of releases of hydrocarbons have been proposed above and will break the pathway between the potential source and each receptor. The residual effect will be – negative, imperceptible, indirect, short term, unlikely effect to local groundwater quality. Negative, imperceptible, indirect, short term, unlikely impact to surface water quality.

Significance of Effects: For the reasons outlined above, no significant effects on surface water or groundwater quality will occur.

9.5.3.4 Potential Effects on WFD Status

The EU Water Framework Directive (2000/60/EC) requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027 at the latest. Any new development must ensure that this fundamental requirement of the Directive is not compromised. The WFD status for GWBs and SWBs underlying and downstream of the Site are defined in Section 9.3.11 and Section 9.3.12.1 respectively.

All GWBs (Abbeyfeale and Rathmore West) underlying the Site are of 'Good' status.

In terms of SWBs, the majority of the Site drains to the Feale_010 SWB which achieved 'High' status in the latest WFD cycle. This was an improvement in status in comparison to the previous cycles. Existing infrastructure associated with the Taurbeg Wind Farm is mapped in the Glenacarney_010 and Glenlara_010 WFD river sub-basins. These SWBs achieved 'Good' and 'Moderate' status respectively and their status has remained unchanged across all 3 no. WFD cycles. Meanwhile, the Owenkeal_010 SWB has experienced a reduction in status from 'High' in 2010-2015 to 'Good' in subsequent cycles. However, no infrastructure associated with the wind farm is present within this WFD river sub-basin.

A detailed WFD Compliance Assessment Report has been completed in combination with this EIAR Chapter and is included in Appendix 9-3.

Pathways: Drainage and surface water discharge routes.

Receptors: WFD status.

Pre-Mitigation Potential Effect: No effect.

Impact Assessment / Proposed Mitigation Measures:

There is no direct discharge from the Site to downstream receiving waters. Mitigation for the protection of surface water during the extended operational phase will ensure the qualitative status of the receiving SWBs will not be altered by the Proposed Lifetime Extension.

Similarly, there is no direct discharge to groundwaters associated with the extended operational phase. Mitigation for the protection of groundwater during the extended operational phase will ensure that the qualitative status of the receiving GWB will not be altered by the Proposed Project.

It is worth noting that there has been no deterioration in the status of the SWBs in the vicinity of the Site during the operational phase to date. Indeed, the status of the Feale_010 SWB which drains the majority of the Site has improved in status during the lifetime of the Taurbeg Wind Farm. Therefore, the existing drainage controls and mitigation measures being implemented are effective. These will continue to be implemented during the Proposed Lifetime Extension.

Post-Mitigation Residual Effects:

There will be no change in GWB or SWB status in the underlying GWB or downstream SWBs resulting from the Proposed Lifetime Extension. There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWB and downstream SWBs are protected from any potential deterioration.

No residual effect on Groundwater Body WFD status will occur.
No residual effect on Surface Water Body WFD status will occur.

As such, the Proposed Project is compliant with the requirements of the Water Framework Directive (2000/60/EC).

Significance of Effects: For the reasons outlined above, no significant effects on WFD GWB and SWB status, risk or future objectives will occur as a result of the Proposed Lifetime Extension.

9.5.3.5 Potential Effects on Designated Sites

The Site is located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This designated site does not contain any water-dependent special conservation interests. The sole special conservation interest is Hen harrier.

The Site is also hydrologically connected to the Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC.

Due to physical, hydrological and hydrogeological separation all other designated sites have no potential to be affected by the Proposed Lifetime Extension.

Due to there being no proposed construction works, the potential for effects on these designated sites is very limited. However, during minor and infrequent maintenance works there is the potential for the release of suspended solids and hydrocarbons to the surface water environment. These effects could have the potential to impact downstream designated sites.

Pathway: Surface water flowpaths, and groundwater levels.

Receptor: Down-gradient water quality Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC.

Pre-Mitigation Potential Effect: Negative, slight, indirect, short term, likely effect on the Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC.

Proposed Mitigation Measures:

Lower Shannon SAC

The Proposed Lifetime Extension will have no potential to effect the Lower Shannon SAC for the following reasons:

- No proposed construction works;
- The only proposed works comprise of maintenance works which pose the same risks to water quality as all agricultural sites;
- The maintenance works will be of a small scale and will be infrequent in nature;
- The existing drainage system which utilises buffered outfalls, check dams and roadside swales;
- The length of the hydrological connection (~1.8km) between the Site and the Lower River Shannon SAC; and,
- Mitigation measures have been proposed in relation to hydrocarbons and suspended solids which will ensure that there will be no effects on downstream water quality.

Blackwater River (Cork/Waterford) SAC

The Proposed Lifetime Extension will have no potential to effect the Blackwater River (Cork/Waterford) SAC for the following reasons:

- No proposed construction works;
- The only proposed works comprise of maintenance works which pose the same risks to water quality as all agricultural sites;
- The maintenance works will be of a small scale and will be infrequent in nature;
- The existing drainage system which utilises buffered outfalls, check dams and roadside swales;
- The length of the hydrological connection (~6.5km) between the Site and the Blackwater River (Cork/Waterford) SAC; and,
- Mitigation measures have been proposed in relation to hydrocarbons and suspended solids which will ensure that there will be no effects on downstream water quality.

Post Mitigation Residual Effects: Proven and effective measures to mitigate the risk of surface and groundwater contamination have been proposed which will break the pathway between the potential source and the downstream receptor. These mitigation measures will ensure that surface water runoff from the Site will be equivalent to baseline conditions and will therefore have no impact on downstream surface water quality and/or the status or ecology of the protected species and habitats within the designated sites. The residual effect is considered to be Negative, imperceptible, indirect, short term, unlikely effect on the Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC.

Significance of Effects: For the reasons outlined above, no significant effects on any designated sites will occur.

9.5.4 Decommissioning Phase - Likely Significant Effects and Mitigation Measures

The potential impacts associated with decommissioning of the existing Taurbeg Wind Farm will be similar to those associated with construction but of a much-reduced magnitude. A description of the decommissioning works is contained in Chapter 4 of this EIAR and in the Decommissioning Plan (Appendix 4-3).

During decommissioning, it will be possible to reverse or at least reduce some of the potential effects caused during construction, and to a lesser extent operation, by rehabilitating constructed areas such as turbine bases and hard standing areas. This will be done by covering with vegetation to encourage vegetation growth and reduce run-off and sedimentation.

Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled. All above-ground turbine components will be separated and removed off-site. It is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option as excavation works can be avoided.

It is proposed to leave access roads in-situ, as these are in use by the participating landowners to access their lands and as existing walking trails. It is proposed to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works.

During decommissioning, it will be possible to reverse or at least reduce some of the potential impacts caused during construction by rehabilitating construction areas such as turbine bases, hard standing areas. This will be done by covering hardstand areas with peatland vegetation/scraw or poorly humified peat to encourage vegetation growth and reduce run-off and sedimentation.

The disassembly and removal of the turbines will not have an impact on the hydrological/hydrogeological environment at the wind farm site.

Other impacts such as possible soil compaction and contamination by fuel leaks will remain but will be of reduced magnitude than the construction phase because of the smaller scale of the works and reduced volumes on-site.

As noted in the Scottish Natural Heritage report (SNH) Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the wind farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is, therefore:

> *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".*

Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the operational phase mitigation measures.

No significant effects on the hydrological and hydrogeological environment will occur during the decommissioning phase of Taurbeg Wind Farm.

9.5.5 Risk of Major Accidents and Disasters

The main risk of Major Accidents and Disasters (MADS) at upland peatland sites is related to peat stability. Due to there being no construction activities with regard the Proposed Lifetime Extension, no peat stability assessment has been carried out at the Site.) There have been no reported ground instability or peat slides during the operational phase of Taurbeg Wind Farm.

Flooding can also result in downstream Major Accidents and Disasters. However, due to the small scale of the Proposed Lifetime Extension footprint and with the implementation of the proposed mitigation measures, the increased flood risk associated with the Proposed Project is negligible/none (refer to Section 9.5.3.1).

In relation to the Proposed Offsetting Measures, the greatest risk of MADS would be associated with a peatslide and the significant negative effects that such an event would have on downstream surface

water quality. A Peat Stability Risk Assessment (PSRA) has been completed for the Proposed Offsetting lands and concludes that the Proposed Offsetting lands predominantly have an acceptable margin of safety and are suitable for the Proposed Offsetting Measures. The PSRA states that due to the high factors of safety and negligible risk of peat landslides identified on site, it is not anticipated that peat failure will occur on site. However, in the event of peat failure (e.g. tension cracking, surface rippling, sliding), the following measures will be implemented by the contractor:

- All members of the project team will be alerted immediately or as it is safe to do so;
- All site works will be ceased with immediate effect, and all available resources will be used for the management and mitigation of the risks posed by the event;
- Localised peat slides that do not present a risk to watercourses will be stabilised where possible by rock infill and granular material. The area will then be assessed by competent engineers, and further stabilisation measures will be implemented where necessary;
- The key initial activity will be to prevent displaced materials from reaching any watercourses or sensitive environments. Given the terrain of the Proposed Offsetting lands, the key risk is the development of a propagation landslide or slip within topographic valleys and watercourses. Where possible, catch ditches on land or within these topographic valley and watercourses will be constructed to prevent further run out of the disturbed peat or spoil material; and,
- The contractor will be responsible for providing suitable contingencies during deforestation works. The contractor will additionally need to carry out a construction stage PSRA.

9.5.6 Assessment of Health Effects

Potential health effects arise mainly through the potential for surface and groundwater contamination which may have negative effects on public and private water supplies. There are no mapped public or group water scheme groundwater protection zones in the area of the Site. Notwithstanding this, the Proposed Lifetime Extension design and mitigation measures ensures that the potential for effects on the water environment will not be significant.

Flooding of property can cause inundation with contaminated flood water. Flood waters can carry waterborne disease and contamination/effluent. Exposure to such flood waters can cause temporary health issues. However, the assessment presented in Section 9.5.3.1 shows that the Proposed Project has very little potential to increase the downstream flood risk.

No effects on human health will occur as a result of the Proposed Project.

9.5.7 Cumulative Effects

This section presents an assessment of the potential cumulative effects associated with the Proposed Project and other developments (existing and/or proposed) on the hydrological and hydrogeological environment.

The main likelihood of cumulative effects is assessed to be hydrological (surface water quality) rather than hydrogeological (groundwater). Due to the hydrogeological setting of the Site and the Proposed Offsetting lands (i.e. low permeability peat overlying a locally important bedrock aquifer), cumulative effects with regard groundwater quality or quantity arising from the Proposed Project are assessed as not likely.

The primary potential for cumulative effects associated with a wind farm development would generally occur during the construction phase. However, no construction works are proposed and there will be no excavations or earthworks at the Site. The potential for cumulative effects during the Proposed Lifetime Extension will be significantly reduced in comparison to a construction phase as there will be

no exposed excavations, there will be no sources of sediment to reach watercourses, there will be no use of cementitious materials and fuels/oil will be kept to a minimum at the site. During the decommissioning phase, the potential cumulative effects are similar to the construction phase, but to a lesser degree with less ground disturbance.

Separate hydrological cumulative study areas have been delineated for the Site and for the Proposed Offsetting lands. These cumulative study areas are shown in Figure 9-10**.** There will be no potential for cumulative effects beyond these cumulative study areas due to increases in flow volumes (as the catchment area increases) and increasing distance from the Site and the Proposed Offsetting lands.

The cumulative hydrological study area for the Site has a total area of 234km^2 and has been delineated as follows:

- The north of the Site is located in the Tralee Bay Feale Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects on the Feale River downstream of EPA Hydrotool Node: 23_1771 (Total Upstream Catchment Area of ~95km^2); and,
- The south of the Site is located in the Blackwater (Munster) Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects downstream of EPA Hydrotool Node: 18_2469 on the Glenlara River. This Node is located ~2km upstream of the confluence of the Glenlara and Allow Rivers. In order to be conservative and for completeness, the cumulative study area extends downstream as far as Node 18_1756 which includes the entire catchment of the Glenlara River (Total Upstream Catchment Area of ~139km^2)

Given, the nature of the Proposed Lifetime Extension and the lack of any significant groundworks, the delineated cumulative hydrological study area associated with the Site is considered to be very conservative.

The cumulative hydrological study area for the Proposed Offsetting lands has a total area of 74km^2 and has been delineated as follows:

- The Shanowen (Maine)_010 and the Clydagh (Feale)_010 WFD river sub-basins are included in the cumulative study areas as these are the river sub-basins within which the Proposed Offsetting lands are located. For the purposes of a conservative assessment the Maine_010 and Clydagh (Feale)_020 WFD river sub-basins further downstream are also included in the cumulative study area.

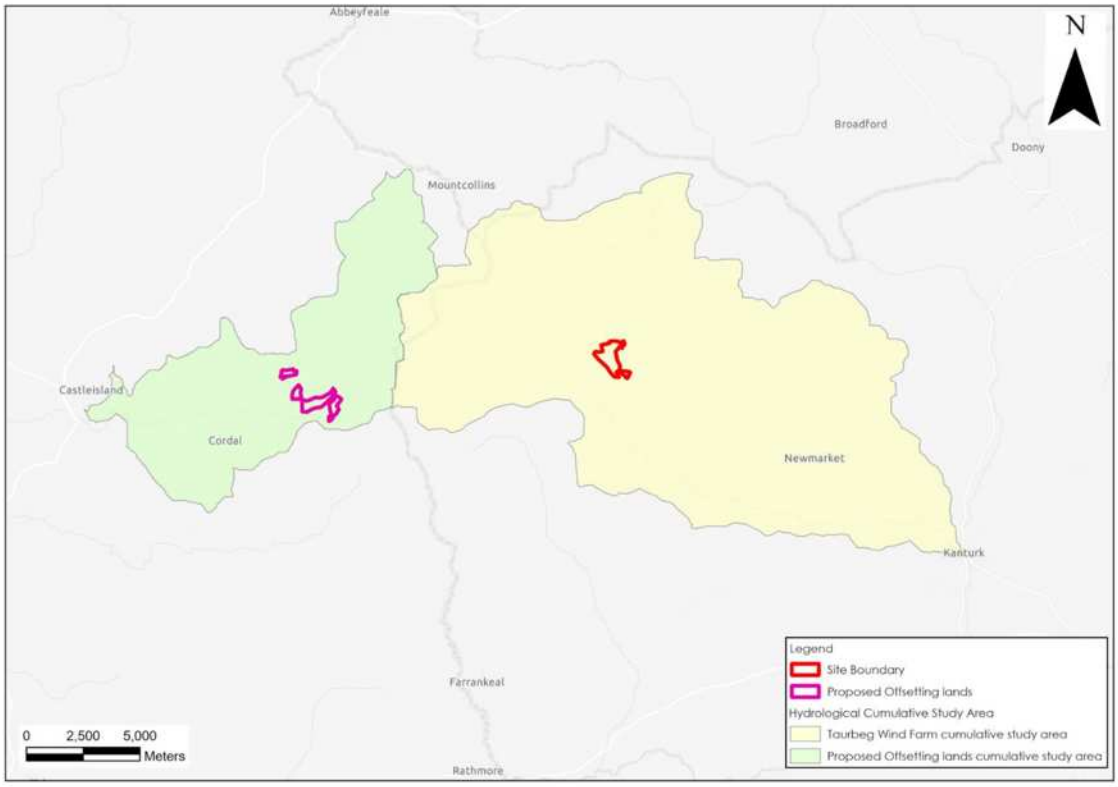


Figure 9-10: Cumulative Hydrological/Hydrogeological Study Area

9.5.7.1 Cumulative Effects with Commercial Forestry

Taurbeg Wind Farm

The Site is situated in an upland area which contains peat bogs and forested areas.

The most common water quality problems arising from forestry relate to the release of sediment and nutrients to the aquatic environment, and impacts from acidification. Forestry may also give rise to modified stream flow regimes caused by associated land drainage.

Due to the close proximity of several forested areas to the Site and given that they drain to the same watercourses, the potential cumulative effects on downstream water quality and quantity need to be assessed.

However, given the nature of the Proposed Lifetime Extension, the lack of any significant groundworks and the prescribed mitigation measures for the proposed extended operational phase, there will be no effects on downstream surface water quality.

For these reasons we consider that there will not be a significant cumulative effect associated with commercial forestry activities.

Proposed Offsetting Measures

Forestry activities will continue in the lands adjacent to the Proposed Offsetting lands. Typical downstream water quality issues arising from forestry activities include elevated concentrations of suspended solids and nutrient enrichment. However, the Proposed Offsetting Measures involves the deforestation of ~105.5ha of coniferous forestry which will result in improved surface water quality and attenuation. This will improve local surface water quality in the vicinity of the Proposed Offsetting lands in comparison to the existing baseline condition where forestry operations are ongoing.

9.5.7.2 Cumulative Effects with Agriculture

Taurbeg Wind Farm

The cumulative study area associated with the Site includes agricultural areas surrounding Newmarket and Rockchapel.

Agriculture is the largest pressure on water quality in Ireland. Agricultural practices such as the movement of soil and the addition of fertilizers and pesticides can lead to nutrient losses and the entrainment of suspended solids in local surface watercourses. This can have a negative effect on local and downstream surface water quality.

Due to the close proximity of several forested areas to the Site and given that they drain to the same watercourses, the potential cumulative effects on downstream water quality and quantity need to be assessed.

However, given the nature of the Proposed Project, the lack of any significant groundworks and the prescribed mitigation measures for the Proposed Project, there will be no effects on downstream surface water quality.

For these reasons it is considered that there will not be a significant cumulative effect associated with agricultural activities.

Proposed Offsetting Measures

The cumulative study area associated with the Proposed Offsetting lands includes agricultural areas to the east of Castleisland. Agricultural practices can have negative effects on water quality associated with nutrient losses and the entrainment of suspended solids in surface waters.

However, the Proposed Offsetting Measures involves the deforestation of ~105.5ha of coniferous forestry which will result in improved surface water quality. This will improve local surface water quality in the vicinity of the Proposed Offsetting lands in comparison to the existing baseline condition where forestry operations are ongoing.

9.5.7.3 Cumulative Effects with Other Developments

A detailed cumulative assessment has been carried out for all planning applications (granted and awaiting decisions) within the cumulative assessment areas described above for both Taurbeg Wind Farm and the Proposed Offsetting lands.

These applications are generally for new dwellings or renovations of existing dwellings, as well as for the erection of farm buildings. There is also a planning permission for the construction of 67 no. dwellings at Cahereen West, Killarney Road, Castleisland (Planning Ref Number: 201198). These developments are typically small scale and localised in nature and impacts on water quality or flows (surface water or groundwater) are not expected. Therefore, hydrological cumulative impacts with respect to the Proposed Project will not occur.

9.5.7.4 Cumulative Effects with Other Wind Farms

Taurbeg Wind Farm

A total of 3 no. existing wind farms have been identified within the hydrological cumulative study area for the wind farm. These include the Coolegrean, Glentane and Knockacummer Wind Farms. These existing wind farms identified within the cumulative study area have already been constructed and are currently in the operational phase of development and are generating electricity. Given that the wind

farms have already been constructed, the potential for cumulative hydrological effects to occur is very limited. The EIARs for the above existing wind farm developments detail potential hydrological and hydrogeological issues relating to the operation and decommissioning phases of these developments and propose a suite of best practice mitigation measures designed to ensure that the developments do not in any way have a negative effect on downstream surface water quality and quantity. There is also a single existing wind turbine at Newmarket which also lies within the hydrological cumulative study area.

The proposed Gooseberry Hill Wind Farm in Co. Cork is also located in the hydrological cumulative study area. This wind farm is currently in the design phase, with 18 no. turbines currently proposed. If this wind farm was to be granted planning permission, it would be accompanied by an EIAR which would prescribe strict mitigation measures for the protection of surface water quality and quantity during the construction, operation and decommissioning phases of this wind farm development.

The mitigation and best practice measures proposed in this EIAR chapter will ensure that the Proposed Project does not have the potential to result in significant effects on the hydrological/hydrogeological environment.

Therefore, there will be no cumulative effects associated with the extended operational or decommissioning phases of the Proposed Project and other wind farms within the cumulative study area.

Proposed Offsetting Measures

The existing Mount Eagle Wind Farm, Coolegrean Wind Farm and Cordal Wind Farm are located within the cumulative study area associated with the Proposed Offsetting Measures. These wind farms are currently in operation. The EIARs for these wind farm developments detail potential hydrological and hydrogeological issues relating to the operation and decommissioning phases and propose a suite of best practice mitigation measures designed to ensure that the developments do not in any way have a negative effect on downstream surface water quality and quantity. Similarly, the mitigation and best practice measures proposed in this EIAR chapter will ensure that the Proposed Offsetting Measures do not have the potential to result in significant effects on the hydrological/hydrogeological environment.

Therefore, there will be no cumulative effects associated with the Proposed Offsetting Measures and other wind farms within the cumulative study area.

9.5.7.5 Cumulative Effects with Wastewater Treatment Plants

Taurbeg Wind Farm

A total of 3 no. urban Wastewater Treatment Plants (WwTPs) are located within the hydrological cumulative study area. These include the Meelin, Newmarket and Rockchapel urban WwTPs. In addition, the WwTP associated with Newmarket Co-operative Creameries Ltd (P0793) is located within the hydrological cumulative study area. The discharge of wastewater to local watercourses and could potentially result in cumulative effects with the Proposed Project. However, these WwTPs discharge treated wastewater and discharge limits have been assigned to the effluent to ensure that the treated wastewater does not have any significant effects on the receiving surface water quality. The available Annual Environmental Reports (AERs) have been reviewed and the WwTPs are largely compliant with respect to the discharge limits.

The mitigation and best practice measures proposed in this EIAR chapter will ensure that the Proposed Project does not have the potential to result in significant effects on the hydrological/hydrogeological environment.

Therefore, there will be no cumulative effects associated with the extended operational or decommissioning phases of the Proposed Project and the WwTPs within the cumulative study area.

Proposed Offsetting Measures

The Brosna WwTP is located in the cumulative study area with wastewater being discharged into the Clydagh River. This WwTP discharges treated wastewater and discharge limits have been assigned to the effluent to ensure that the treated wastewater does not have any significant effects on the receiving surface water quality. There is no potential for cumulative effects.

9.5.8 Post Consent Monitoring

No monitoring is required.

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Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 10 – Air Quality

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10. AIR QUALITY

10.1 Introduction

This chapter identifies, describes and assesses the potential significant direct and indirect effects on air quality arising from the Proposed Lifetime Extension of the existing Taurbeg Wind Farm.

The existing Taurbeg Wind Farm is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork, in the townlands of Taurbeg, Glasheenanargid, Taurmore. The existing Taurbeg Wind Farm is based within private forestry and agricultural lands. Within the wider landscape of the existing Taurbeg Wind Farm, land use comprises wind energy production, agricultural pastures, transitional woodland scrub and peat bogs.

The Proposed Offsetting Lands are located approximately 8km east of Castleisland, Co. Kerry in the townlands of Coom and Knockatee. The Proposed Offsetting Lands are located c. 12km east of the Taurbeg Wind Farm Site in Co. Kerry. The Proposed Offsetting Measures comprise the permanent removal of c. 105.5 ha of coniferous plantation forestry and the restoration of c17.7 ha of farmland for the benefit of hen harrier. Further details on the Proposed Offsetting Measures can be found in Appendix 7-7.

Due to the non-industrial nature of the existing Taurbeg Wind Farm, the fact that it is already operational, no works are required within the Site, and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR. Based on professional judgement it is considered that air quality in the existing environment is reflective of the Environmental Protection Agency's (EPA) Air Quality Zone D, as described in Section 10.2.2.4 below, since there are no major sources of air pollution (e.g., heavy industry) in the vicinity of the Wind Farm Site and Proposed Offsetting Lands.

The production of energy from wind turbines has no direct emissions occurring from fossil fuel-based power stations. Harnessing more energy by means of renewable sources will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that is damaging to human health and the environment. Some minor short term or temporary indirect emissions associated with the decommissioning of the existing Taurbeg Wind Farm include vehicular and dust emissions.

10.1.1 Relevant Guidance and Legislation

The air quality section of this Environmental Impact Assessment Report (EIAR) has been completed in accordance with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU and having regard, where relevant, to guidance listed below.

- Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107' (Transport Infrastructure Ireland, December 2022).
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports – June 2022' (EPA, 2022).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report' (EC, 2017)
- Environmental Protection Agency (2024) Air Quality in Ireland Report 2023.
- Environmental Protection Agency (2021) Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects.
- Environmental Protection Agency
- Guidance on the Assessment of Dust from Demolition and Construction (IAQM 2024);

- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (TII 2011);
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (TII 2009);
- Clean Air Strategy for Ireland (Government of Ireland, 2023).
- UK Department of Environment Food and Rural Affairs (DEFRA) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG (16) (DEFRA 2018);
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) – LA
- 105 Air Quality (UKHA 2019);
- World Health Organization (WHO) Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide Global Update 2005 (WHO 2005).

10.1.2 Statement of Authority

This section of the EIAR has been prepared by Gráinne Griffin and Natalia Stolarska and reviewed by Eoin McCarthy, of MKO. Gráinne is an Environmental Scientist with MKO with over 2 years' experience in the environmental consultancy sector. Gráinne has experience in report writing, including Appropriate Assessments, Natura Impact Statements, feasibility studies and EIA screening reports and EIAR chapters including Population and Human Health chapters for large-scale renewable energy developments. Natalia Stolarska is an Environmental Scientist with MKO. Natalia holds a BSc in Earth and Ocean Science and an MSc in Environmental Leadership. Natalia's key strengths and areas of expertise are in drafting EIAR report chapters, environmental impact assessment screening reports, wind farm feasibility studies and QGIS mapping. Since joining MKO in September 2023, Natalia has been involved in a range of wind farm projects, assisting with field work, client briefing notes, constraints mapping and drafting EIAR chapters, with more projects in the pipeline. Eoin is a Project Director with over 13 years of environmental consultancy experience. Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway. In his role as project manager, Eoin works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs.

10.2 Air Quality

10.2.1 Relevant Legislation

In 1996, the Air Quality Framework Directive (on ambient air quality assessment and management) (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).
- The third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).

- The fourth Daughter Directive[1] (2004/107/EC),, published in 2004, relates to polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air and was transposed into Irish law by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2009 (S.I. No. 58 of 2009) (amended by SI 659/2016 - Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016.)

The Air Quality Framework Directive and the first three Daughter Directives were replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality and cleaner air for Europe) (as amended by Directive EU 2015/1480), which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for particulate matter less than 2.5 micrometers (µm) referred to as $PM_{2.5}$ including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years for particulate matter less than 10µm (PM_{10}) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 10-1 below sets out the limit values of the CAFE Directive, as derived from the Air Quality Framework Daughter Directives. Limit values are presented in micrograms per cubic metre (µg/m^3) and parts per billion (ppb). The notation PM_{10} is used to describe particulate matter or particles of 10µm or less (coarse particles) in aerodynamic diameter. $PM_{2.5}$ represents particles measuring less than 2.5µm (fine particles) in aerodynamic diameter.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) as amended by the Air Quality Standards (Amendments) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2016 (S.I. 659 2016). The 2011 Regulations superseded the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the Ambient Air Quality Assessment and Management Regulations 1999 (S.I. No. 33 of 1999). The Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) was revoked on 31 December 2022 and has been replaced by the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022).

10.2.2 Air Quality Standards

The recently implemented Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022) remains aligned to the CAFÉ Directive and diverts to the CAFÉ Directive for the Limit values outlined in Table 10-1, the Assessment Thresholds in Table 10-2, the Ozone limits and Assessment Thresholds in Table 10-3 and Table 10-4 respectively.

Table 10-1 Limit values of the CAFE Directive 2008/50.EC, Source: https://airquality.ie/information/air-quality-standards)

[1] *IEEP Fourth Daughter Directive 2004. Available at: https://ieep.eu/publications/the-fourth-air-quality-daughter-directive-impacts-and-consequences-of-mandatory-limits/*

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m3)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of Human Health	1 hour	350	Not to be exceeded more than 24 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of human health	24 hours	125	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of vegetation	Calendar year	20	Annual mean	19th Jul 2001
Sulphur dioxide (SO_2)	Protection of vegetation	1st Oct to 31st Mar	20	Winter mean	19th Jul 2001
Nitrogen dioxide (NO_2)	Protection of human health	1 hour	200	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide (NO_2)	Protection of human health	Calendar year	40	Annual mean	1st Jan 2010
Nitrogen monoxide (NO) and nitrogen dioxide (NO_2)	Protection of vegetation	Calendar year	30	Annual mean	19th Jul 2001
Particulate matter 10 (PM_{10})	Protection of human health	24 hours	50	Not to be exceeded more than 35 times in a calendar year	1st Jan 2005
Particulate matter 10(PM_{10})	Protection of human health	Calendar year	40	Annual mean	1st Jan 2005

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m3)	Basis of Application of Limit Value	Attainment Date
Particulate matter 2.5 ($PM_{2.5}$) Stage 1	Protection of human health	Calendar year	25	Annual mean	1st Jan 2015
Particulate matter 2.5 ($PM_{2.5}$) Stage 2	Protection of human health	Calendar year	20	Annual mean	1st Jan 2020
Lead (Pb)	Protection of human health	Calendar year	0.5	Annual mean	1st Jan 2005
Carbon Monoxide (CO)	Protection of human health	8 hours	10,000	Not to be exceeded	1st Jan 2005
Benzene (C_6H_6)	Protection of human health	Calendar Year	5	Annual Mean	1st Jan 2010

Table 10-2 Assessment Thresholds from CAFE Directive 2008/50/EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
Sulphur dioxide (SO_2)	Upper assessment threshold for the protection of Human Health	24 hours	75	Not to be exceeded more than 3 times in a calendar year
Sulphur dioxide (SO_2)	Lower assessment threshold for the protection of human health	24 hours	50	Not to be exceeded more than 3 times in a calendar year
Nitrogen dioxide (NO_2)	Upper assessment threshold for the protection of human health	1 hour	140	Not to be exceeded more than 18 times in a calendar year
Nitrogen dioxide (NO_2)	Lower assessment threshold for the protection of human health	1 hour	100	Not to be exceeded more than 18 times in a calendar year
Particulate matter 10 (PM_{10})	Upper assessment threshold	24 hours	35	Not to be exceeded more

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
				than 35 times in a calendar year
Particulate matter 10 (PM_{10})	Lower assessment threshold	24 hours	25	Not to be exceeded more than 35 times in a calendar year
Lead (Pb)	Upper assessment threshold	Calendar Year	0.35	-
Lead (Pb)	Lower assessment threshold	Calendar Year	0.25	-
Carbon Monoxide (CO)	Upper assessment threshold	8 hours	7000	-
Carbon Monoxide (CO)	Lower assessment threshold	8 hours	5000	-
Benzene (C_6H_6)	Upper assessment threshold	Calendar Year	3.5	-
Benzene (C_6H_6)	Lower assessment threshold	Calendar Year	2	-

Ozone is set out differently in the CAFE Directive in that it sets target values and long-term objectives for ozone rather than limit values. Table 10-3 presents the target values and long-term target value for ozone and Table 10-4 details the threshold values for Ozone.

Table 10-3 Target values for Ozone defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Long- term Objective
Protection of human health	Maximum daily 8-hour mean	120 $\mu g/m^3$ not to be exceeded more than 25 days per calendar year averaged over 3 years	120 $\mu g/m^3$
Protection of vegetation	AOT40* calculated from 1-hour values from May to July	18,000 $\mu g/m^3$.h averaged over 5 years	6,000 $\mu g/m^3$ h

* AOT40 is a measure of the overall exposure of plants to ozone. It is the sum of the excess hourly concentrations greater than 80 µg/m3 and is expressed as µg/m3 hours.

Table 10-4 Threshold for Ozone Defined in Directive 2008/50/EC (source: https://airquality.ie/information/air-quality-standards and Directive 2008/50/EC)

Pollutant	Averaging Period	Threshold
Information Threshold	1-hour average	180 $\mu g/m^3$

Alert Threshold	1-hour average	240 µg/m^3

10.2.2.1 Air Quality and Health

In September 2024, the EPA published 'Air Quality in Ireland 2023'[2] which reports that although Ireland met the current EU legal air quality limits in 2023, monitoring results were higher than the more stringent health-based World Health Organization air quality guidelines for a number of pollutants including: particulate matter (PM), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and ozone (O_3). The main sources of these pollutants are the burning of solid fuel in our towns and villages and traffic in our cities. People's health and the health of our environment is impacted by these pollutants. Ireland's ambition in the 'Clean Air Strategy for Ireland' (discussed below) is to move towards alignment with the World Health Organisation (WHO) Air Quality guidelines, this will be challenging but will have a significantly positive impact on health. Despite comparing favourably with many of our European neighbours, Ireland's 2023 monitoring results would exceed the soon approaching 2026 WHO targets,

The European Environmental Agency (EEA) Briefing, '*Europe's Air Quality Status 2024*[3] highlights the negative effects that air pollution has on human health. The briefing notes that air pollution is Europe's largest environmental health risk, causing cardiovascular and respiratory diseases that impact health, reduce quality of life and cause preventable deaths. In 2022, despite ongoing reductions in emissions, most of the EU's urban population continued to be exposed to levels of key air pollutants that are damaging to health. In 2022 in the European Union, 96% of the urban population was exposed to levels of fine particulate matter ($PM_{2.5}$) above the health-based guideline level set by the World Health Organisation (WHO). Furthermore, in 2022 in the EU, 88% of the urban population were exposed to levels of nitrogen dioxide above the health-based guideline level set by the WHO. Whilst there is the potential of such emissions to be generated from the Proposed Lifetime Extension and decommissioning phases of the existing Taurbeg Wind Farm, mitigation measures will be implemented at the Site to reduce the impact from dust and vehicle emissions, which are discussed in Section 10.2.5 below.

The United States Department of Energy published an article on August 21, 2024 entitled '*How Wind Can help Us Breathe Easier*.'[4] This article details the CO_2 emissions from different energy sources over the entire lifespan of the technology. It was found that wind energy produces around 11 grams of CO_2 per kilowatt-hour (g CO_2/kWh) of electricity generated, compared with about 980 g CO_2/kWh for coal and roughly 465 g CO_2/kWh for natural gas. That makes coal's carbon footprint almost 90 times larger than that of wind energy, and the footprint of natural gas more than 40 times larger. During combustion of high-emitting energy sources, other air pollutants, i.e., nitrogen oxides (NOx) and sulphur dioxide (SO_2), are also released into the atmosphere. This results in the emission of pollutants that can cause adverse health effects, including asthma, bronchitis, lower and upper respiratory symptoms, and heart attacks. Air pollution is responsible for a large number of premature deaths relating to these illnesses.

The EPA 2020 report '*Ireland's Environment – An Integrated Assessment*'[5] states that across Europe, the most problematic pollutants have consistently been particulate matter, nitrogen oxides and ozone. The EPA 2020 report goes on to state that:

[2] *Environmental Protection Agency: Air Quality in Ireland 2023. Available at: https://www.epa.ie/publications/monitoring–assessment/air/air-quality-in-ireland-2023.php*
[3] *European Environment Agency Europe's air quality status 2024. Available at: https://www.eea.europa.eu/publications/europes-air-quality-status-2024*
[4] *US Department of Energy 'How Wind Can Help Us Breathe Easier' August 2024. Available at: https://www.energy.gov/eere/wind/articles/how-wind-can-help-us-breathe-easier*
[5] *EPA Ireland's Environment An Integrated Assessment 2020. Available at: https://www.epa.ie/publications/monitoring–assessment/assessment/state-of-the-environment/EPA_Irelands_Environment_2020.pdf*

"Ireland has excellent indigenous renewable energy resources, and renewable energy is playing an increasing role in the domestic energy supply. Ireland has more onshore (land-based) and offshore energy potential than most other European countries.

The use of renewable energy reduces or eliminates generation losses, which are significant for combustion related generation. Reducing these losses also contributes to meeting energy targets and decarbonisation. Overall, reducing the loss and waste of energy has multiple ***benefits for the climate and human health and wellbeing****."*

The Proposed Lifetime Extension therefore represents an opportunity to further harness Ireland's significant renewable energy resources, with valuable benefits to air quality and in turn to human health. The consumption of fossil fuels for energy results in the release of particulates, sulphur dioxide and nitrogen dioxide to our air. The use of wind energy, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide SO_2, thereby resulting in cleaner air and associated positive health effects.

Ireland's Clean Air Strategy 2023[6] sets out the detail of seven strategic frameworks that will be used to ensure that air quality continues to improve. The aims of these key strategic frameworks are:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country, to deliver health benefits for all.
- To ensure the integration of clean air considerations into policy development across Government.
- To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution and their impacts on health, in order to address them more effectively.
- To enhance regulation required to deliver improvements across all pollutants.
- To improve the effectiveness of our enforcement systems.
- To promote and increase awareness of the importance of clean air, and the links between cleaner air and better health.
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

[6] *Rialtas na hÉireann Clean Air Strategy April 2023. Available at: https://www.gov.ie/en/publication/927e0-clean-air-strategy/#:~:text=The%20Clean%20Air%20Strategy%20provides,delivering%20on%20wider%20national%20objectives.*

Figure 10-1 Seven Strategic Frameworks for Air Quality, with associated chapters in brackets. Reproduced as Figure 1 from Clean Air Strategy 2023

Chapter 11 of the Clean Air Strategy discusses Air Quality Policy Development. The chapter discusses energy policy and acknowledges how the State's accelerated transition to renewable electricity will be critical to successfully meeting the ambitious renewable energy and greenhouse gas emission reduction targets outlined in the European Green Deal and Ireland's Climate Action Plan 2023, as well as to protecting against security of supply risks and removal of fossil fuels from power generation. Wind (offshore and onshore) and solar energy will be the leading cost-effective technologies to achieve our energy and emissions targets, as well as displacing emissions in other sectors, including household heating and vehicle transport. In the Clean Air Strategy, the Climate Action Plan 2023 is referenced, while Climate Action Plan 2024 is currently the latest revision. The targets of the Climate Action Plan 2024 and the Green Deal are to deliver net-zero GHG emissions by 2050 and reduce GHG emissions to at least 55% by 2030, compared to 1990 levels.

10.2.3 Methodology

10.2.3.1 Air Quality Zones

The air quality zone for the Proposed Project was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO2), Particulate Matter (PM_{10}), Nitrogen Dioxide (NO2), Carbon Monoxide (CO) and Ozone (O3) for the selected air quality zone to determine the representative levels of such emissions for the Proposed Project.

The EPA has designated four Air Quality Zones for Ireland:

- Zone A: Dublin and environs
- Zone B: Cork and environs
- Zone C: 16 urban areas with population greater than 15,000
- Zone D: Remainder of the country

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the CAFE Directive. The existing Taurbeg Wind Farm site and Proposed Offsetting Lands lie within Zone D, which represents rural areas located away from large population centres.

10.2.3.2 Air Quality Data Review

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, 'Air Quality in Ireland 2023' was published by the EPA in 2024. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone D. These are detailed in the Baseline Air Quality section below.

10.2.3.3 Dust

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024) was considered in the dust impact assessment. The guidance document outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. This methodology has been used to predict the likely risk of dust as a result of the operational phase activities and decommissioning phase. The use of UK guidance is considered best practice in the absence of applicable Irish guidance. The major dust generating activities are divided into four types within the IAQM (2024) guidance to reflect their different potential impacts. These are:

- Demolition (There are no demolition works required for the Proposed Offsetting Lands. There are demolition works required for the Decommissioning Phase of the Proposed Lifetime Extension.)
- Earthworks (There are small scale earthworks required for the Proposed Lifetime Extension through maintenance works. There are earthworks required for the Decommissioning Phase.)
- Construction (There are no construction works required for any phase of the Proposed Lifetime Extension or Proposed Offsetting Lands.)
- Trackout - The transport of dust and dirt from the site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when Heavy Goods Vehicles (HGVs) leave the site with dusty materials, which may then spill onto the road, and/or when HGVs transfer dust and dirt onto the road having travelled over muddy ground on site.

The magnitude of dust generating activities is divided into 'Large', 'Medium' or 'Small' scale depending on the nature of the activities involved. IAQM (2024) guidance provides example definitions for the scale of the activities, and these are applied for this development as outlined in Table 10-5.

Table 10-5 Description of magnitude for nature of activities

	Large	Medium	Small
Demolition	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12m above ground level	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	Large: Total site area >110,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height	Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height

	Large	Medium	Small
Construction	Total building volume >75,000 m^3, on site concrete batching, sandblasting	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m
	Note: A vehicle movement is a one way journey. i.e. from A to B and excludes the return journey. HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average		

Proposed Lifetime Extension

There will be no Construction associated with the Proposed Lifetime Extension. Small scale Earthworks are associated with the Proposed Lifetime Extension for maintenance purposes. The number of vehicle movements per day, as outlined in Section 15.2.4.3 in Chapter 15 Material Assets of this EIAR, results in the classification of the existing Taurbeg Wind Farm Site as 'Small' for trackout activities.

There will be Small to Medium Earthworks, Demolition and Trackout associated with the decommissioning phase of the existing Taurbeg Wind Farm.

Proposed Offsetting Measures

There will be no Demolition or Construction associated with the Proposed Offsetting Measures. There will be small scale earthworks and trackout associated with the Proposed Offsetting Measures. There will be no excavation of peat or subsoil as part of the Proposed Offsetting Measures. For the purposes of this assessment, deforestation for the purposes of Proposed Offsetting Measures is defined as earthworks.

The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities.

10.2.3.3.1 *Defining the Sensitivity of the Area*

For the purposes of this assessment, high sensitivity receptors are residential properties and dust sensitive ecological habitats. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

There are no high, medium, or low sensitivity receptors in this project for either the Proposed Lifetime Extension or Proposed Offsetting Measures.

The IAQM (2024) guidance has outlined three types of effects to be considered:

- Sensitivities of People to Dust Soiling Effects
- Sensitivities of People to the Health Effects of PM_{10}
- Sensitivities of Receptors to Ecological Effects

Sensitivities of People to Dust Soiling Effects

Dust soiling effects can occur for a distance of 250m from works areas, but the majority of deposition occurs within the first 50m (IAQM, 2024). Table 10-6 below identifies the sensitivity of an area to dust soiling effects on people and their properties, relative to different receptor sensitivities.

Table 10-6 Sensitivity of the Area to Dust Soiling Effects on People and Property. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Sensitivities of People to the Health Effects of PM_{10}

When assessing sensitivity of people to the health effects of PM_{10}, the IAQM (2024) guidance recommends the use of sensitivities bands based on whether or not the receptor is likely to be exposed to elevated concentrations of PM_{10} over a 24-hour period. Table 10-7 below identifies the sensitivity of an area to human health effects of PM_{10}, relative to different receptor sensitivities.

Table 10-7 Sensitivity of the Area to Human Health Impacts. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Sensitivities of Receptors to Ecological Effects

Dust deposition due to demolition, earthworks, construction, and trackout has the potential to physically and chemically affect sensitive habitats and plant communities. Table 10-8 below identifies the sensitivity of an area to ecological impacts.

Table 10-8 Sensitivity of the Area to Ecological Impacts. Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024)

Receptor Sensitivity	Distance from source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

There are ecological sensitive receptors, as described by the IAQM (2024) guidance within the existing Taurbeg Wind Farm, due to it being located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle Special Protection Area (SPA). There are small scale earthworks associated for the Proposed Lifetime Extension during the decommissioning phase. There will be no construction associated with the Proposed Lifetime Extension. There are no demolition or construction works associated with the Proposed Offsetting Measures, with small scale earthworks and trackout being proposed, this being temporary in nature.

Therefore, dust impacts on ecological receptors have been scoped out from this assessment.

10.2.3.3.2 *Defining the Risk of Impacts*

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts with no mitigation applied. The matrix in Table 10-9 provides a method of assigning the level of risk for each activity.

Table 10-9 Risk of Dust Impacts for Earthworks, Construction, Trackout (IAQM, 2024)

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

The risk of dust impacts for the earthworks, demolition, and trackout activities from the Proposed Lifetime Extension is summarised in Section 10.2.5 below.

EPA classification terminology as presented in Table 1-2 of Chapter 1 of this EIAR have been correlated with the equivalent risk rating from Table 10-10.

Table 10-10 Correlation of Impact Classification Terminology (EPA, 2022) to Risk Rating

EPA Term	EPA Description	Risk Rating
Imperceptible	An effect capable of measurement but without significant consequences	Negligible
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities	Low
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends	Medium
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment	High

10.2.4 Baseline Air Quality

The air quality in the vicinity of the Site and Proposed Offsetting Lands is typical of that of rural areas in the southwest of Ireland, i.e., Zone D. Prevailing south-westerly winds carry clean, unpolluted air from the Atlantic Ocean onto the Irish mainland.

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, *'Air Quality in Ireland 2023'* was published by the EPA in September 2024. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone D. Values for each of these elements recorded within the Zone D monitoring stations listed in the report, have been averaged to give representative values for Zone D. Similar measurement values for all air quality parameters would be expected for the Site and Proposed Offsetting Lands as both lie in a rural location, within Zone D.

10.2.4.1 Sulphur Dioxide (SO_2)

Sulphur dioxide data for Cork Harbour, Kilkitt, Shannon Estuary/Askeaton, Edenderry and Letterkenny in 2023 is presented in Table 10-11.

Table 10-11 Sulphur Dioxide Data for Zone D Sites in 2023

Parameter	Measurement
Annual Mean	4.3 µg/m^3
Hourly values > 350	0
Hourly max (Average)	80.9 µg/m^3
Daily values > 125	0
Daily max (Average)	23.2

During the monitoring period there were no exceedances of the daily limit values for the protection of human health. As can be observed from Table 10-11 the average maximum hourly value recorded during the assessment period was 80.9 µg/m^3. In addition, there were no exceedances of the annual mean limit for the protection of ecosystems. It is expected, based on professional judgement that SO_2 values at the existing Taurbeg Wind Farm site and Proposed Offsetting Lands are similar or lower than those recorded for the Zone D sites above.

10.2.4.2 Particulate Matter (PM_{10})

Sources of particulate matter include vehicle exhaust emissions, dust from soil and road surfaces, construction works and industrial emissions. The *'Air Quality in Ireland 2023'* report provides annual mean PM_{10} concentration for seventeen Zone D towns, Tipperary Town, Carrick-on-Shannon/Askeaton, Enniscorthy, Birr, Macroom, Castlebar, Cobh Carrignafoy, Claremorris, Kilkitt, Cavan, Roscommon Town, Edenderry, Mallow, Longford, Killarney and Malin Head. Particulate matter (PM_{10}) data for 2023 is presented in Table 10-12.

Table 10-12 Particulate Matter (PM10) Data for Zone D Sites in 2023

Parameter	Measurement
Annual Mean	10.8 µg/m^3
% Data Capture (Average)	966%
Values > 50 ug/m^3	Max 6 (Edenderry)
Daily Max (Average)	45.4 µg/m^3

Notes: [1-] PM_{10} daily limit for the protection of human health: No more than 35 days >50 µg/m^3

The daily limit of 50 µg/m^3 for the protection of human health was exceeded on 40 days, which is greater than the PM_{10} daily limit for the protection of human health of a max 35 days >50 µg/m^3 applicable from 2005. The greatest number of exceedances occurred at Edenderry where the PM_{10} daily limit was exceeded on 6 no. occasions. In the '*Air Quality in Ireland 2023*' report, it notes that there were breaches in the levels of particulate matter (PM), which in Ireland, mainly comes from the burning of solid fuel, such as coal, peat, and wood to heat our homes. It is expected based on professional judgement that PM_{10} values at the existing Taurbeg Wind Farm site and Proposed Offsetting Lands are similar or lower than those recorded for the Zone D sites above.

10.2.4.3 Nitrogen Dioxide (NO_2)

Nitrogen dioxide data for Emo Court, Birr, Castlebar, Carrick-on-Shannon, Kilkitt, Edenderry and Briarhill in 2023 is presented in Table 10-13.

Table 10-13 Nitrogen Dioxide Data for Zone D Sites in 2023

Parameter	Measurement
Annual Mean (Average)	8.1 µg/m^3
NO_2 Values >200	0
Values > 140 (UAT)	0
Values >100 (LAT)	4
Hourly Max. (Average)	67.6 µg/m^3

The annual NO_2 value was below the annual mean limit value for the protection of human health of 40 µg/m^3. The lower assessment threshold of 100 µg/m3 was exceeded 4 no. times during the monitoring period in Briarhill while the upper assessment threshold of 140 µg/m3 was not exceeded during the monitoring period. The lower assessment threshold did not exceed the 18 days limit during the monitoring period. In 2023, no other monitoring locations in Zone D had exceedances in the lower and upper assessment thresholds of 100 and 140 µg/m3. The average hourly max. NO_2 value of 67.6 µg/m^3 measured during the monitoring period was below the hourly max threshold of 200 µg/m^3. It is expected based on professional judgement that NO_2 values at the existing Taurbeg Wind Farm site and Proposed Offsetting Lands are similar or lower than those recorded for the Zone D sites above.

10.2.4.4 Carbon Monoxide (CO)

The '*Air Quality in Ireland 2023*' report provides rolling 8-hour carbon monoxide concentrations for Birr, a Zone D site. Carbon Monoxide data for 2023 is presented in Table 10-14.

Table 10-14 Carbon Monoxide Data for Birr - Zone D Site in 2023

Parameter	Measurement
Annual Mean	0.6 mg/m^3
Median	0.6 mg/m^3
% Data Capture	99.8%
Values > 10	0
Max	2.2 mg/m^3

The average concentration of carbon monoxide was 0.6 mg/m^3. The carbon monoxide limit value for the protection of human health is 10,000 µg/m^3 (or 10 mg/m^3). On no occasions were values in excess of the 10 mg limit value set out in Directive 2008/50/EC. It is expected based on professional judgement that CO values at the existing Taurbeg Wind Farm site and Proposed Offsetting Lands are similar or lower than those recorded for the Zone D site above.

10.2.4.5 Ozone (O_3)

The EPA report provides rolling 8-hour ozone concentrations for seven Zone D sites, Emo Court, Kilkitt, Carnsore Point, Mace Head, Castlebar, Valentia and Malin Head. Ozone (O_3) data for 2023 is presented in Table 10-15. As can be observed from Table 10-15 there were 10 no. exceedances of the maximum daily eight-hour mean limit of 120 µg/m3. The CAFE Directive stipulates that this limit should not be exceeded on more than 25 days per calendar year averaged over 3 years. It would be expected on professional judgement that O_3 values at the existing Taurbeg Wind Farm site and Proposed Offsetting Lands would be similar or lower than those recorded for the Zone D sites below.

Table 10-15 Ozone Data for Zone D Sites in 2023

Parameter	Measurement
Annual Mean	61.5µg/m3
Median	72.8 µg/m3
% Data Capture	95.5%
No. of days > 120 µg/m^3	10 days

10.2.4.6 Dust

There are no statutory limits for dust deposition in Ireland. However, EPA guidance suggests that a deposition of 10 mg/m^2/hour can generally be considered as posing a soiling nuisance. This equates to 240 mg/m^2/day. The EPA recommends a maximum daily deposition level of 350 mg/m^2/day when measured according to the TA Luft Standard 2002. This limit value can also be implemented with regard to dust impacts from activities associated with the Proposed Lifetime Extension and Proposed Offsetting Measures.

The extent of dust generation at any site depends on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, etc., and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather.

The potential dust-related effects on local air quality and the relevant associated mitigation measures are presented in Sections 10.2.5 below.

10.2.5 Likely and Significant Effect and Associated Mitigation Measures

10.2.5.1 'Do-Nothing' Effect

If the Proposed Project were not to proceed, the existing Taurbeg Wind Farm would be decommissioned in accordance with the conditions of the current planning permission.

If the Proposed Project were not to proceed, the opportunity to further significantly reduce emissions of greenhouse gas emissions, including CO_2, NO_x and SO_2 to the atmosphere would be lost. The opportunity to contribute to Ireland's commitments under the Kyoto Protocol and EU law would also be lost. This would be a medium-term, slight negative effect.

If the Proposed Lifetime Extension were not to proceed, the existing Taurbeg Wind Farm would be decommissioned and the use of machinery during the decommissioning of the existing wind farm

would result in the emission of greenhouse gases. Operations such as the transport of equipment and materials as well as construction personnel are typical examples of machinery use. This impact is considered to be imperceptible, given the insignificant quantity of greenhouse gases that would be emitted. This would likely result in a short-term, imperceptible, negative effect.

If the Proposed Offsetting Measures were not to proceed, existing land use of plantation forestry and agricultural practises within the Proposed Offsetting Lands would continue and the Proposed Offsetting Measures would not take place. As such, this would have a long term, imperceptible positive effect on air quality.

10.2.5.2 Construction Phase

Taurbeg Wind Farm is currently operational, and it is proposed to extend the operational phase of the wind farm by a further 10 years. No construction activities will occur as part of the Proposed Lifetime Extension, therefore there are no construction phase impacts on air quality.

10.2.5.3 Extended Operational Phase

10.2.5.3.1 *Exhaust Emissions*

Proposed Lifetime Extension

Exhaust emissions associated with the Proposed Lifetime Extension arise from machinery and vehicles that are intermittently required onsite for maintenance. This will give rise to a medium-term, imperceptible, negative effect due to the localised and intermittent nature of the maintenance.

Mitigation

- Any vehicles or plant brought onsite during the extended operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.

Residual Effect

Medium-term, imperceptible, negative effect.

Proposed Offsetting Measures

Exhaust emissions associated with the Proposed Offsetting Measures will arise from machinery and vehicles that are required onsite for deforestation works. This will give rise to a localised and temporary, not significant, negative effects due to the nature and expected duration of the deforestation works.

Mitigation

- Any vehicles or plant brought onsite during the extended operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.

Residual Effect

Temporary, imperceptible, negative effect.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on air quality associated with the Proposed Project.

10.2.5.3.2 *Air Quality*

Proposed Lifetime Extension

The Proposed Lifetime Extension, by providing an alternative to electricity derived from coal, oil or gas-fired power stations, results in emission savings of carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2). The continued production of renewable energy from the existing Taurbeg Wind Farm has a medium-term, significant, positive effect on air quality, and thus not requiring mitigation. Further details on the carbon dioxide savings associated with the Proposed Lifetime Extension are presented in Chapter 11, Section 11.4.

Mitigation

None proposed.

Residual Effect

The residual effect is a medium-term, moderate, positive effect. An output of 2.3 MW per turbine has been chosen to calculate the power output of the 11-turbine wind energy development, which results in an estimated installed capacity of 25.3 MW of electricity that doesn't directly emit carbon dioxide (CO_2), oxides of nitrogen (NO_x), or sulphur dioxide (SO_2). Whilst there are potentially higher rated turbines, the residual effect will not be altered.

Proposed Offsetting Measures

As part of the Proposed Offsetting Measures, it is proposed to permanently remove 105.5 ha of forestry to create suitable habitat for hen harrier. This will give rise to a permanent, imperceptible, negative effect on air quality due to the loss of carbon storage associated with the deforestation of trees.

Mitigation

None proposed.

Residual Effect

Permanent, imperceptible, negative effect.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on air quality associated with the Proposed Project.

10.2.5.3.3 Human Health

Proposed Lifetime Extension

Exposure to chemicals such as SO_2 and NO_x are known to be harmful to human health. The production of clean renewable energy from Taurbeg Wind Farm has and will continue to offset the emission of these harmful chemicals by fossil fuel-powered sources of electricity and, therefore the Proposed Lifetime Extension will have a medium-term Slight Positive effect on human health. Further information on the impact of the Proposed Lifetime Extension on Human Health is contained in Chapter 5: Population and Human Health.

Mitigation

None proposed.

Residual Effect

Medium-term Slight Positive effect.

Proposed Offsetting Measures

As part of the Proposed Offsetting Measures, it is proposed to permanently remove 105.5 ha of forestry which will create suitable habitat for hen harrier. Whilst the deforestation works will give rise to minor increases in dust and vehicle emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent or minimise potential effects off-site. Good management practice consists of good site design and layout, adopting appropriate working methods, choosing the right equipment and ensuring that the workforce understands the company's responsibilities and is familiar with good working practice and dust suppression techniques. The potential for health effects are considered negligible as the potential for both exhaust and dust emissions will be limited and controlled through mitigation measures.

Mitigation

None proposed.

Residual Effect

Short-term slight negative effect.

Significance of Effects- Proposed Project

Based on the assessment above, there will be no significant direct or indirect effects on air quality associated with the Proposed Project.

10.2.6 Decommissioning Phase

The Proposed Project is seeking permission for an extension of operational life of 10 years. Following the extension of operational life, Taurbeg Wind Farm would be decommissioned unless a further planning permission is received.

The works required during the decommissioning phase are described in Section 4.7 in Chapter 4: Description of the Proposed Project.

A Decommissioning Plan is included in Appendix 4-3 of this EIAR for the decommission of the Taurbeg Wind Farm, further detail of which will be agreed, if required, with the local authority prior to any decommissioning.

Pre-Mitigation Impact

Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above-ground turbine components will be separated and removed off-site for reuse or recycling.

It is proposed to leave the existing turbine foundations in place underground and to cover them with earth and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.

It is proposed that site roadways will be left in situ, as appropriate, as these are in use by the participating landowners to access their lands and as existing walking trails. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed where required, however, this is not envisaged at this time. It is proposed to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works.

During decommissioning, it may be possible to reverse or at least reduce some of the potential impacts caused during the initial construction of the wind farm by rehabilitating construction areas such as turbine bases and hard standing areas. This will be done by covering with local topsoil and reseeding with a local native mix to encourage vegetation growth and reduce run-off and sedimentation.

It is expected that the pre-mitigation impact associated with decommissioning of the Taurbeg Wind Farm will have a short-term, slight and negative effect on air quality.

Mitigation Measures

- A decommissioning plan (Appendix 4-3) has been prepared as part of the EIAR, which includes mitigation measures for the decommissioning phase of Taurbeg Wind Farm. These include:
- Prior to the end of the operational period the Decommissioning Plan will be updated in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time.
- Upon decommissioning of the wind farm, turbine foundations will remain in place underground and will be covered with earth and reseeded with an appropriate seed mix to accelerate the resumption of natural drainage management.
- The underground cable ducting within the wind farm site will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance.
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary;
- All site related traffic will have speed restrictions on un-surfaced roads to 15 kph;
- Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions.

Please refer to Section 7 of Appendix 4-3 for further details.

Residual Effect

The residual effect on Air Quality is a short-term, imperceptible and negative effect.

Significance of Effects

Based on the assessment above there will be no significant effects.

10.2.7 Cumulative Assessment

Potential cumulative effects on air quality between the Proposed Project (Proposed Lifetime Extension and Proposed Offsetting Measures) and other developments, including the existing grid connection, in the vicinity were also considered as part of this assessment. Please see Section 2.11 of Chapter 2 for cumulative assessment methodology.

The developments considered as part of this cumulative effect assessment are presented in Appendix 2-3 of this EIAR, with relevant developments within 1km of the EIAR site boundary being considered.

There were no potential cumulative effects identified as part of this assessment for either the Proposed Lifetime Extension, nor the Proposed Offsetting Measures.

Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

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11. CLIMATE

11.1 Introduction

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on climate arising from the extension of operation and decommissioning of the Proposed Project and has been completed in accordance with the EIA guidance and legislation set out in Chapter 1: Introduction. The full description of the Proposed Project (Proposed Lifetime Extension and Proposed Offsetting Measures) is detailed in Chapter 4 of this EIAR.

The objective of this assessment is to assess the potential effects that the Proposed Project may have on Climate and set out proposed mitigation measures to avoid, reduce or offset any potential significant effects that are identified. Chapter 16 of this EIAR consolidates the risks and vulnerabilities identified throughout all EIAR chapters to assess the overall risk to the Proposed Project concerning major accidents and natural disasters, including climate change.

The aim of the Proposed Lifetime Extension, when in operation, is to reduce the input of carbon intensive energy into the national grid and reduce the amount of greenhouse gas emissions being released to the atmosphere that are associated with electricity generation and use. Harnessing more energy by means of renewable sources will reduce dependency on fossil fuels, thereby resulting in a reduction in harmful emissions that can be damaging to human health and the environment.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Lifetime Extension', 'Proposed Offsetting Measures', 'Proposed Offsetting Lands', 'Proposed Project' and 'the Site'.

11.1.1 Background

The Existing Taurbeg Wind Farm is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork, in the townlands of Taurbeg, Glasheenanargid and Taurmore. The Existing Taurbeg Wind Farm is based within peat bogs, agricultural pastures, coniferous forestry and transitional woodland scrub. Within the wider landscape of the Existing Taurbeg Wind Farm, land use comprises wind energy production, agricultural pastures, transitional woodland scrub and peat bogs.

It is intended that the Proposed Lifetime Extension will connect into the national grid via the existing onsite 38kV substation to the existing Glenlara 110kV Substation. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The overhead line does not form part of the current planning application but has been assessed cumulatively with the rest of the Existing Taurbeg Wind Farm infrastructure, as part of the EIAR.

11.1.2 Scoping and Consultation

The scope for this chapter of the EIAR has also been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties. This consultation process and the List of Consultees is outlined in Section 2.9 of Chapter 2 of this EIAR. Matters raised by Consultees in their responses with respect to climate are summarised in Table 11-1 below.

Table 11-1 Summary of Climate Related Scoping Response

Consultee	Description	Addressed in Section
Failte Ireland	Transportation emissions affect not only air quality, but also greenhouse gases. Changing climatic patterns due to climate change should be factored into this analysis.	Section 11.3 and Section 11.5.2

	There is a requirement for tourist developments to describe expected significant effects on the environment of the proposed development's vulnerability to major accidents and/or natural disasters relevant to it. Where appropriate measures should be identified to prevent or mitigate the significant adverse effects of such accidents or disasters, including resulting from climate change, on the environment and detail the preparedness for the proposed response.	
Health Service Executive (HSE)	The Environmental Health Service (EHS) recommends that the following matters are included and assessed in the EIAR: › Climate change and opportunity for health gain	Section 11.5.2

11.1.3 Chapter Structure and Climate Study Areas

This chapter of the EIAR provides an assessment of the potential significant direct and indirect effects on climate arising from all phases of the Proposed Project.

The chapter structure is as follows:

- A review of all relevant climate change legislation policy and guidance applicable to the Proposed Project in an international, national, and local context (Section 11.2)
- Presentation of the baseline environment (Section 11.3 below), including:
  - A description of the current baseline environment established from desk study, utilising relevant datasets and data provided within other sections of the EIAR (Section 11.3.1 below)
  - A description of the future baseline environment, established from desk study, utilising relevant datasets and data provided within other sections of the EIAR (Section 11.3.2 below)
- A detailed carbon assessment, which considers how the Proposed Project, and the Existing Taurbeg Wind Farm, will affect the greenhouse gas emissions associated with Ireland as a result of activities associated with the extended operation and decommissioning phases (inclusive of both carbon losses and carbon savings) (Section 11.4 below)
- Presents an assessment of the potential likely significant effects on climate arising from the Proposed Project during the extended operational phase (Section 11.5.2), and decommissioning phase (Section 11.5.3) based on the information gathered and the analysis and assessments undertaken.
  - All required mitigation measures to prevent, minimise, reduce or offset the likely significant environmental effects identified in the construction phase, operational phase, and decommissioning phase is provided in this section.
- An assessment of potential cumulative impacts is provided in Section 11.6 and details any potential cumulative effects on climate between the Proposed Project and other permitted or proposed projects and plans in the area, (wind energy or otherwise) for the construction phase (Section 11.6.1), operational phase (Section 11.6.2), and decommissioning phase (Section 11.6.3)

By their very nature, the impacts and resulting effects of greenhouse gas emissions are global rather than affecting one localised area. For the purposes of this EIAR, the overall Climate Study Area for the Proposed Project is defined as the national environment (Ireland), where the receptor is the climate and the global atmosphere. As stated in the IEMA 2022 guidance *'greenhouse gas emission impacts and*

resulting effects are global rather than affecting one localised area'[1]. Therefore, effects arising from the potential impacts on climate are considered to impact on a national level. National, regional and local data has been considered where relevant and available. The study areas considered across the different assessments provided within this report are detailed below.

Baseline Environment

- Current Baseline
  - Current Baseline Study Area: defined as the EIAR Site Boundary, as defined in Section 1.1.1 of Chapter 1 of this EIAR. Relevant information taken from EIAR Chapters for inclusion in the current baseline assessment is within the relevant discipline's specific assessment boundary, as identified in each cited EIAR Chapter.
- Future Baseline
  - Future Baseline Study Area: defined as the EIAR Site Boundary, i.e., the primary study area for the EIAR as defined in Section 1.1.1 of Chapter 1 of this EIAR. Relevant information taken from relevant EIAR Chapters for inclusion in the future baseline assessment will be within the relevant discipline's specific assessment boundary, as identified in each cited EIAR Chapter.

Carbon Assessment

- Carbon Assessment Study Area: defined as the EIAR Site Boundary, as defined in Section 1.1.1 of Chapter 1 of this EIAR.

11.1.4 Statement of Authority

This section of the EIAR has been prepared by Catherine Johnson and reviewed by Eoin McCarthy, both of MKO. Catherine is an Environmental Scientist and Climate Practitioner at MKO with over three years of consultancy experience in renewable energy projects. Catherine has expertise in greenhouse gas assessments, international climate law and policy, earth science, and sustainability/ESG processes. Catherine possesses skills in mapping and design, which complement her experience in preparing comprehensive reports for EIAs with a particular focus on climate change. Catherine has a BSc in Earth and Ocean Science and an LLM in Global Environment and Climate Change Law. Eoin is a Project Director with over 13 years of environmental consultancy experience. Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway.

11.2 Climate Legislation, Policy and Guidance

Although variation in climate is thought to be a natural process, the rate at which the climate is changing has been accelerating rapidly by human activities. Climate change is one of the most challenging global issues facing the world today and is primarily the result of increased levels of greenhouse gases in the atmosphere. Increasing human emissions of carbon dioxide and other greenhouse gases cause a positive radiative imbalance at the top of the atmosphere, meaning energy is being trapped within the climate system. The imbalance leads to an accumulation of energy in the

[1] *IEMA (2022). Assessing Greenhouse Gas Emissions and Evaluating their Significant, 2nd Edition. Available online at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions*

Earth system in the form of heat that is driving global warming.[2,3] Greenhouse gases come primarily from the combustion of fossil fuels in energy use.

In March 2023 the European Environment Agency (EEA) published the European Climate Risk Assessment.[4] This assessment states that Europe is the fastest warming continent on the planet and is warming at about the twice the global rate. The average global temperature in the 12-month period between February 2023 and January 2024 exceeding pre-industrial levels by 1.5°C. 2023 was the warmest year on record over more than 100,000 years globally, at 1.48°C above pre-industrial levels, with the world's ocean temperature also reaching new heights.

The Intergovernmental Panel on Climate Change (IPCC), in their AR6 Synthesis Report: Climate Change 2023[5], state that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. This has led to widespread adverse impacts and related losses and damages to people and nature due to the pressures of climate change and the inability to adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and mitigate the human activity catalysing climate change.

Relevant legislation, policy, and guidance in an international (Section 11.2.1), national (Section 11.2.2), and local (Section 11.2.3) context are detailed below.

11.2.1 International Greenhouse Gas Emission and Climate Targets

Globally, governance relating to climate change has changed significantly since 1994 when the United Nations Framework Convention on Climate Change (UNFCCC) entered into force. Greenhouse Gas emissions have been a primary focus of climate related international agreements for almost two decades.

Table 11-2 below identifies international instruments relating to greenhouse gas emissions and climate change targets. The following table provides an overview of the international agreements that have played key roles in establishing climate governance; please refer to Appendix 11-1 Climate Legislation and Policy for further detail on each of the below international instruments.

Table 11-2 International Instruments Relating to Greenhouse Gas Emissions and Climate Change Targets

International Instrument	Description
Kyoto Protocol	The Kyoto Protocol was adopted on 11 December 1997; this Protocol operationalised the UNFCCC and was the first international agreement that committed countries to reduce their greenhouse gas emissions. The Kyoto Protocol came into effect in 2005, as a result of which, emission reduction targets agreed by developed countries, including Ireland, became binding for the first time.
Doha Amendment to the Kyoto Protocol	In Doha, Qatar, on 8th December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

[2] *Hansen, J.; Sato, M.; Kharecha, P. et al. Earth's Energy Imbalance and Implications. Atmospheric Chemistry and Physics 2011, 11 (24), 13421–13449. https://doi.org/10.5194/acp-11-13421-2011*
[3] *von Schuckmann, K.; Palmer, M. D.; Trenberth, K. E. et al. An Imperative to Monitor Earth's Energy Imbalance. Nature Clim Change 2016, 6 (2), 138–144. https://doi.org/10.1038/nclimate2876.*
[4] *European Environment Agency (2023) European Climate Risk Assessment <https://climate-adapt.eea.europa.eu/en/eu-adaptation-policy/key-eu-actions/climate_risk_assessment/index_html/>*
[5] *IPCC AR6 Synthesis Report: Climate Change 2023. https://www.ipcc.ch/report/sixth-assessment-report-cycle/*

	› New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from starting in 2013 and lasting until 2020. › A revised list of greenhouse gases to be reported on by Parties in the second commitment period; and
Conference of the Parties (COP): *Every year since 1995, the Conference of the Parties (COP) has gathered the 196 Parties (195 countries and the European Union) that have ratified the Convention in a different country, to evaluate its implementation and negotiate new commitments, and is the supreme decision-making body of the UNFCCC.*	**COP21 – Paris** (30th November to 12th December 2015) COP21 closed with the adoption of the first international climate agreement (concluded by 195 countries and applicable to all). The twelve-page text, made up of a preamble and 29 articles, provides for a limitation of the temperature rise to below 2°C above pre-industrial levels and even to tend towards 1.5°C.
	COP25 – Madrid (December 2nd to December 13th, 2019) At COP25 the European Union launched its most ambitious plan, 'The European Green Deal' which aims to lower CO_2 emissions to zero by 2050.
	COP28 – Dubai (30th of November 2023 to the 13th of December 2023) COP28 resulted in a landmark deal to 'transition away' from fossil fuels, the United Arab Emirates (UAE) Consensus. The agreement calls for 'transitioning away from fossil fuels in energy systems, in a just, orderly, and equitable manner.' COP28 concluded the first ever Global Stocktake under the Paris Agreement. The Global Stocktake recognises that the world is not on track to meet 1.5°C and will require Parties to align their national targets and measures with the Paris Agreement.
	COP29 – Azerbaijan (11th November 2024 to 22nd November 2024) COP29 focused on accelerating global efforts to address climate change, in particular global efforts related to climate finance. The New Collective Quantified Goal on Climate Finance (NCQG) was agreed in the final days of COP with developed nations agreeing to triples finance to developing countries, with commitments increasing from USD 100 billion annually to USD 300 billion annually by 2035. Significant progress was made in the discussions surrounding carbon markets, with nearly 200 nations agreeing on critical rules under Article 6 of the Paris Agreement. The adoption of these rules is seen as a crucial step towards operationalising a robust and credible carbon market. Despite the advances, concerns were expressed about the potential for weak governance and risks of exploitation in the system; these issues must be addressed to ensure the market's full functionality.
United Nations Sustainable Development Goals	On the 28th of June 2024, the United Nations published 'The Sustainable Development Goals Report 2024' this report finds that, following an assessment of all 169 targets, for which trend data is available, only 17% of the SDG targets are on track, 48% of SDG targets are showing minimum or moderate progress, 18% having stalled in progress and 17% having regressed from 2023.
Climate Change Performance Index	Established in 2005, the Climate Change Performance Index (CCPI)[6] is an independent monitoring tool which tracks individual countries climate protection performance.

[6] *Climate Change Performance Index 2024* <https://ccpi.org/>

	Ireland, ranked 43rd in 2024, has risen 14 places to 29th for 2024, and is now considered a 'medium' performer in international performance. The CCPI states that Ireland's policies are missing a long-term strategy for phasing out fossil fuel infrastructure and shifting investments from natural gas towards an emissions-neutral energy supply.
State of the Global Climate 2024	In March 2025, the World Meteorological Organisation (WMO) published a report entitled the 'State of the Global Climate 2024. This report provided a summary on the state of the climate indicators in 2023 with sections on key climate indicators, extreme events and impacts. The key messages in the report include: › Greenhouse gases reached record observed levels in 2023. Real time data indicate that they continued to rise in 2024. › The annually averaged global mean near-surface temperature in 2024 was 1.55 °C ± 0.13 °C above the 1850–1900 average used to represent pre-industrial conditions.
Renewable Energy Directive	The first Renewable Energy Directive (RED)[7] is legislation that influenced the growth of renewable energy in the EU and Ireland for the decade ending in 2020. From 2021, RED was replaced by the second Renewable Energy Directive (REDII),[8] which continues to promote the growth of renewable energy out to 2030. REDII introduced a binding EU-wide target for overall RES of 32% in 2030 and requires Member States to set their national contributions to the EU-wide target. As per the National Energy and Climate Plan (NECP) 2021-2030, Ireland's overall RES target is 34.1% in 2030. Given the need to ratchet up the EUs clean energy transition, RED was revised in 2023, and the amending Directive EU/2023/2413 (REDIII)[9] entered into force on 20 November 2023. REDIII amended the EU-wide overall 2030 RES target from 32% to at least 42.5%, and it is assumed that Irelands 2030 RES target will increase accordingly.
European Green Deal	The European Green Deal is a comprehensive package of policy initiatives aimed at achieving climate neutrality across the EU by 2050. It features a wide range of actions and targets in different sectors such as energy, transport, industry, environment and agriculture. The goal is to transform the EU into a resource-efficient, competitive circular economy that is fair and inclusive for every individual and region. In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Under the EU Green Deal, the targets for the ETS and non-ETS sectors will be revised upwards in order to achieve the commitment, at EU level, to reach an economy-wide 2030 reduction in emissions of at least 55%, compared to 1990 levels.
Council Regulation (EU) 2022/2577 and 2024/223	Council Regulation (EU) 2022/2577 and 2024/223 lay down a framework to accelerate the deployment of renewable energy. Regulation 2022/2577 and 2024/223 recognises the relative importance of renewable energy deployment

[7] *Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Available from: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:en:PDF*
[8] *Directive (EU) 2018/2001 on the promotion of the use of energy from renewable resources (recast). Available from: https://eurlex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L2001*
[9] *Directive (EU) 2023/2413 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302413*

	in the current difficult energy context and provides significant policy and legislative support to enabling renewable energy projects. Further detail is provided in Section 1.1.1.9 of Appendix 11-1 and in Section 2.4.1 in Chapter 2 of this EIAR.
EU Nature Restoration Law	The Nature Restoration Law is the first continent-wide, comprehensive law of its kind. It is a key element of the EU Biodiversity Strategy, which sets binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. The law aims to restore ecosystems, habitats and species across the EU's land and sea areas in order to › Enable the long-term and sustained recovery of biodiverse and resilient nature › Contribute to achieving the EU's climate mitigation and climate adaptation objectives › Meet international commitments The EU Nature Restoration Law was approved on June 17th, 2024; EU countries are expected to submit National Restoration Plans to the Commission within two years of the Regulation coming into force (by mid-2026), showing how they will deliver on the targets. They will also be required to monitor and report on their progress.
EU Effort Sharing Regulation	Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR). This established binding annual greenhouse gas emission targets for Member States for the period 2021–2030. Ireland is required to reduce its emissions from these sectors by 30% by 2030, relative to 2005 levels. Please see Section 1.1.1.10 of Appendix 11-1 for further details on the EU ESR

11.2.2 National Greenhouse Gas Emission and Climate Targets

Ireland has reached a crucial point in addressing climate change with a goal to becoming climate neutral by 2050 and to significantly cut greenhouse gases by 2030. National greenhouse gas emission and climate change targets are critical for achieving Irelands climate ambitions.

Table 11-3 below provides an overview of the national agreements that have played key roles in establishing climate governance; please refer to Appendix 11-1 Climate Legislation and Policy for further detail on each of the below national legislation measures.

Table 11-3 National Legislation and Reports relating to Greenhouse Gas Emission and Climate Change Targets

National Instrument	Description
Programme for the Government – Securing Irelands Future	The Programme for Government – Securing Irelands Future was published in January 2025. The programme notes that the government are committed to reducing greenhouse gas emissions by an average 7% per annum over the next decade in a push to achieve a net zero emissions by the year 2050. The Programme states the Government's ongoing support and commitment to take "*the necessary action to deliver at least 70% renewable electricity by 2030*".

Climate Action and Low Carbon Development Act 2015	The Climate Action and Low Carbon Development Act 2015 established the national framework for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy.
Climate Action and Low Carbon Development (Amendment) Act 2021	The Climate Action and Low Carbon (Amendment) Act 2021 is a piece of legislation which builds on the Climate Action and Low Carbon Development Act 2015 and commits the country to move to a climate resilient and climate neutral economy by 2050. This was passed into law in July 2021. The Programme for Government has committed to a 7% average yearly reduction in overall greenhouse gas emissions over the next decade, and to achieve net zero emissions by 2050. This Act will manage the implementation of a suite of policies to assist in achieving these annual targets.
Climate Change Advisory Council	The Climate Change Advisory Council (CCAC) was established on 18th January 2016 under the Climate Action and Low Carbon Development Act 2015. The Annual Review 2024: Electricity report has been released by the CCAC and focuses specifically on key findings and recommendations for the Electricity sector. In 2023, emissions from the sector reduced by approximately 21% from 2022 to the lowest level since records began in 1990. This was driven by a considerable decline in the use of coal for electricity generation, coupled with a notable rise in imported electricity.
Carbon Budgets	The first national carbon budget programme proposed by the CCAC, approved by Government and adopted by both Houses of the Oireachtas in April 2022 comprises three successive 5-year carbon budgets. The total emissions allowed under each budget are shown in Section 1.1.2.5 of Appendix 11-1.
Sectoral Emission Ceilings	The Sectoral Emissions Ceilings were launched in September 2022. The Sectoral Emissions Ceilings alongside the annual published Climate Action Plan provide a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030. The Sectoral Emission Ceilings for each 5-year carbon budget period was approved by the government on the 28th of July 2022 and is shown in Section 1.1.2.6 of Appendix 11-1.
Climate Action Plan 2025	The National Climate Action Plan (CAP) 2025 was launched in April 2025. CAP 2025 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022 following the Climate Action and Low Carbon Development (Amendment) Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. CAP 2025 highlights the firm commitment that has been made by Ireland in relation to the clean energy transition and provides an outline of precise goals for renewable energy, focusing on solar, onshore wind, and offshore wind.
Irelands Climate Change Assessment	In 2023 the EPA published Irelands Climate Change Assessment (ICCA). This assessment provides a comprehensive overview and breakdown of the state of knowledge around key aspects of climate change with a focus on Ireland. The ICCA report is presented in four volumes. › Volume 1: Climate Science – Ireland in a Changing World › Volume 2: Achieving Climate Neutrality in 2050 › Volume 3: Being Prepared for Irelands Future › Volume 4: Realising the Benefits of Transition and Transformation

	Please refer to Section 1.1.2.8 of Appendix 11-1 for further information on the ICCA.

11.2.3 Local Greenhouse Gas Emission and Climate Targets

11.2.3.1 Cork County Council Local Authority Climate Action Plan 2024-2029

The Cork County Council Local Authority Climate Action Plan 2024-2029[10] (Cork LACAP) was adopted and published in February 2024.

The Cork LACAP highlights the current state of climate action in Ireland, and how Cork County Council will be responsible for enhancing climate resilience, increasing energy efficiency, and reducing greenhouse gas emissions, across its own assets and services. The Cork LACAP provides a mechanism for bringing together both adaptation and mitigation actions to help drive positive climate action and outcomes across the local authority and its administrative area. The framework of climate actions set within the plan, configures the arrangement of climate actions within a defined structure that ensures alignment between on the ground actions and the high-level vision that the plan aspires to deliver. The Cork LACAP will help address the mitigation of greenhouse gases, the implementation of climate change adaption measures, and will strengthen the alignment between national climate policy and the delivery of effective local climate action.

Overall, the greenhouse gas emissions generated from County Cork equated to 8,083,000tCO2 in the baseline year 2018. The top three emitting sectors within County Cork in terms of total greenhouse gas emissions in the baseline year were agriculture, transport and commercial & manufacturing, producing 43%, 15%, and 13% of total emissions respectively. Cork County Council, along with all public sector entities must reduce greenhouse gas emissions by 51% by 2030 as compared to 2018 in line with the National Climate Action Plan 2024 (Section 11.2.2 above).

During the operational phase the Proposed Lifetime Extension will assist in reducing emission by enabling renewable energy to be fed into the grid and the subsequent decarbonisation of other sectors, particular the main emitting sectors in County Cork as identified above. Please see Section 11.4.3.2 below for further information on carbon savings associated with the Proposed Lifetime Extension.

The Cork LACAP assesses climate risk relevant to Ireland and to County Cork, this, plus the evidence baseline, inform the climate objectives and actions that will be undertaken by Cork County Council to assist in the achievement of national and international climate targets.

11.2.3.2 Cork County Development Plan 2022-2028

The Cork County Development Plan 2022-2028[11] (CCDP) sets out the overall strategy for the proper planning and sustainable development of the County over a 6-year period. The CCDP includes numerous actions and objectives on sustainability and climate for Cork to achieve over the 6-year period.

In relation to wind energy, the CCDP states that *'[i]n 2020, installed wind capacity reached 3,700 MW within the Republic of Ireland. Cork County currently has 38 commissioned wind farms with capacity of 603MW, equivalent to approximately 16% of the national capacity. However, if Ireland is to meet our*

[10] *Cork County Council Local Authority Climate Action Plan 2024-2029.* <https://www.corkcoco.ie/sites/default/files/2024-02/cork-county-council-climate-action-plan-2024-2029.pdf>
[11] *Cork County Development Plan 2022-2028* <https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028>

renewable energy target then we need to double capacity nationally over the next ten years. On a pro rata basis, that could see capacity in Cork expand to 1,100MW. At present they are valid but unimplemented permissions in the county for a further 200MW of wind power.'[12]

A key objective identified in the CCDP relating to wind energy is as follows:

- **ET 13-4**: In order to facilitate increased levels of renewable energy production consistent with national targets on renewable energy and climate change mitigation as set out in the National Energy and Climate Plan 2021-2030, the Climate Action Plan 2021, and any updates to these targets, and in accordance with Ministerial Guidelines on Wind Energy Development, the Council will support further development of on-shore wind energy projects including the upgrading, repowering or expansion of existing infrastructure, at appropriate locations within the county in line with the Wind Energy Strategy and objectives detailed in this chapter and other objectives of this plan in relation to climate change, biodiversity, landscape, heritage, water management and environment etc..

Further detail on local policy relating to wind energy in Co. Cork can be found in Section 2.6.3 of Chapter 2 of this EIAR.

11.2.4 Relevant Guidance

The climate chapter of this EIAR is carried out in accordance with the 'EIA Directive' as amended by Directive 2014/52/EU and has been prepared in accordance with guidance listed in Section 1.8.2 of Chapter 1: Introduction. Due to the nature of the Proposed Lifetime Extension, a wind farm project, the following methodology and guidance was utilised for the climate section of this EIAR:

- '*Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment'* (2013) European Commission
- Transport Infrastructure Ireland (TII) Carbon Assessment Tool (Version 0.7.10) (TII, 2020)
- *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition'* (IEMA 2022)

Consideration has also been given to the 'Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107' (Transport Infrastructure Ireland, December 2022 (2022a)), Climate Assessment of Proposed National Roads – Standard and Overarching Technical Documentation (Transport Infrastructure Ireland December 2022b/c) and Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document, GE-ENV-01106 (TII 2022d).

This chapter identifies, describes, and assesses the potential significant direct and indirect effects on climate arising from the continued operation and decommissioning of the Proposed Lifetime Extension and has been completed in accordance with the EIA Directive and the guidance listed in Section 1.1.1 of Chapter 1 Introduction.

11.3 Climate and Weather

11.3.1 Baseline Environment

Climate change projections show that the Earth is getting warmer and extreme weather events are increasing in frequency on an annual basis. The Proposed Project will assist in mitigating these effects

[12] *Ibid (page 296)*

through the deployment of clean renewable energy to the national grid and subsequent decarbonisation of energy systems, and the rehabilitation of coniferous forestry and agricultural land for hen harrier. Please refer to Appendix 7-7 for further detail on Proposed Offsetting Measures. Changes to climate and weather in Ireland will occur as a result of climate change, for further details on the risks associated with the Proposed Project please refer to Chapter 16: Major Accidents and Natural Disasters.

11.3.1.1 Data Sources

A review of literature and data relating to climate change in Ireland was undertaken and utilised to provide an overview of the current baseline environment. The following key data sources were reviewed:

- Met Éireann 30-Year Averages[13]
- Irelands Climate Averages 1991-2020 Summary Report[14]
- Ireland's National Inventory Report 2025[15]
- Climate Status Report for Ireland 2020[16]
- Annual Review 2025 – Our Changing Climate in 2024[17]

11.3.1.2 Physical Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Shannon Airport which is located approximately 50 kilometres to the north of the Site, is the nearest weather and climate monitoring station to the Site that has meteorological data recorded for the 30-year period from 1991-2020. Meteorological data recorded at the Shannon Airport weather station over the 30-year period from 1991-2020 is shown in Table 11-4 below. The wettest months are November and December, with April and May being the driest. July is the warmest month with an average temperature of 16° Celsius.

More recent monthly meteorological data recorded at Shannon Airport, located approximately 50km north of the Site, from January 2022 to January 2025 is available at: https://www.met.ie/climate/available-data/monthly-data. December 2023 was the wettest month in this time period, with 202.9mm of rainfall recorded, while March 2022 was the driest month with 39mm of rainfall. June 2023 was the warmest month in this time period, with a mean monthly temperature of 16.7° Celsius. December 2022 was the coldest month in this time period with a mean monthly temperature of 3.4° Celsius.

Table 11-5 below provides a summary of the current physical baseline environment with reference to relevant chapters within the submitted EIAR where further information is available.

[13] https://www.met.ie/climate/30-year-averages
[14] *Department of Housing, Local Government and Heritage (2024) Irelands Climate Averages 1991-2020 Summary Report* <https://edepositireland.ie/bitstream/handle/2262/108695/Ireland%27s_climate_averages_1991-2020_rev2.pdf?sequence=1&isAllowed=y>
[15] *EPA (2025) Ireland's National Inventory Report* <https://www.epa.ie/publications/monitoring–assessment/climate-change/air-emissions/Ireland's-NID-2025.pdf>
[16] *EPA (2021) Climate Status Report for Ireland 2020* <https://www.epa.ie/publications/research/climate-change/research-386-the-status-of-irelands-climate-2020.php>
[17] *Climate Change Advisory Council (2025) Annual Review 2025 – Our Changing Climate in 2024* <https://www.climatecouncil.ie/councilpublications/annualreviewandreport/CCAC%20AR25%20Our%20Changing%20Climate-final.pdf>

Table 11-4 Data from Met Éireann Weather Station at Shannon Airport from 1991-2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE (degrees Celsius)													
Mean daily max	8.9	9.4	10.9	13.4	16	18.3	19.5	19.1	17.5	14.2	11.1	9.2	14
Mean daily min	3.3	3.3	4	5.8	8.1	10.8	12.6	12.4	10.7	8.1	5.5	3.7	7.4
Mean temperature	6.1	6.3	7.5	9.6	12	14.5	16	15.8	14.1	11.2	8.3	6.4	10.7
Absolute max.	14.7	15.5	19.6	23	27.8	32	30.2	29.2	25.6	21.9	17.2	15.4	32
Absolute min.	-11.2	-5.1	-5.8	-2.9	0.1	3.1	6.2	4.4	1.7	-2.3	-6.6	-11.4	-11.4
Mean num. of days with air frost	5.2	4.6	3.2	0.6	0	0	0	0	0	0.4	1.9	4.4	20.3
Mean num. of days with ground frost	13	11.8	11.9	7.7	2.9	0.2	0	0	0.8	3.3	8	11.3	70.9
RELATIVE HUMIDITY (%)													
Mean at 0900UTC	87.8	87.9	85	79.3	76.2	76.6	80	82.3	85.1	87.4	89.9	88.9	83.9
Mean at 1500UTC	81.2	75.4	69.8	64.1	63.5	64.6	69.3	69.1	70	75	81	83.5	72.2
SUNSHINE (Hours)													
Mean daily duration	1.7	2.4	3.6	5.4	5.9	5.5	4.4	4.6	3.9	3	2.1	1.5	3.7
Greatest daily duration	8.1	10.2	11.5	13.6	15.6	15.8	15.7	14.4	12.2	10.1	8.3	7.1	15.8
Mean num. of days with no sun	9.1	5.9	5.3	2.3	1.9	1.8	2.1	2.1	2.6	5.1	7.7	10.1	56
RAINFALL (mm)													
Mean monthly total	103.8	86.7	75.8	62.3	63.1	69.6	75.8	87.6	77.4	95.5	106.6	115.4	1019.7
Greatest daily total	38.2	33.8	34.8	40.2	25	45.3	39.5	51	52.3	36.9	29.4	33.5	52.3
Mean num. of days with >= 0.2mm	21.3	18.3	18	16.2	16.2	15.5	18.3	19	17.7	19.9	21.6	21	223
Mean num. of days with >= 1.0mm	16.9	13.9	13.4	11.4	12.1	11.3	13.5	13.7	12.9	15.4	16.8	17.2	168.5
Mean num. of days with >= 5.0mm	7.8	5.8	5.5	4.7	4.6	4.8	4.9	5.8	4.8	7	8	8.5	72.2
WIND (knots)													
Mean monthly speed	10	10.1	9.6	9.2	9	8.5	8.4	8.3	8.4	8.9	9.1	9.7	9.1
Max. gust	75	86	63	66	52	51	52	61	58	66	69	83	86
Max. mean 10-minute speed	47	61	44	45	37	37	38	44	44	47	50	57	61
Mean num. of days with gales	2.1	1.2	1.4	0.5	0.5	0.1	0	0.1	0.6	0.9	1	1.5	9.8

WEATHER (Mean No. of Days With:)													
Snow or sleet	1.5	1.8	1.2	0.3	0	0	0	0	0	0	0.1	1	5.9
Snow lying at 0900UTC	0.2	0	0.1	0	0	0	0	0	0	0	0	0.1	0.5
Hail	3.1	3.4	2.8	2	0.7	0	0	0.1	0.1	0.5	1	2.3	16
Thunder	0.9	0.4	0.3	0.3	0.5	0.4	0.7	0.5	0.2	0.3	0.3	0.4	5.2
Fog	3.4	2.2	2.4	1.8	1.3	1	0.9	1.6	2.8	3.1	4	3.8	28.3

Table 11-5 Summary of Current Physical Baseline Environment

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
Air Temperature	Climate change is impacting air temperatures in the Northern European region, with a range of observable effects including rising temperature, increased frequency of heatwaves, changes in seasonal temperature patterns and milder winters[18]. Irelands Climate Averages 1991-2020 Summary Report identifies that the annual mean air temperature for Ireland over the period 1991-2020 is 9.8°C. The annual mean air temperature ranges from approximately 8.5°C to 10.8°C. Comparing the 1991-2020 annual mean air temperature for Ireland with that of the 1961-1990 period, there has been an increase of approximately 0.7°C. The Climate Status Report for Ireland 2020[19] states that air temperatures in Ireland have '*been increasing at an average rate of 0.078°C per decade since 1900 and that the annual average temperature is now approximately 0.9°C higher than it was in the early 1900s'.* Temperatures in Ireland are increasing, with sixteen of the top 20 warmest years on record occurring since 1990[20]. On 10th July 2024 Met Éireann confirmed that 2023 was Irelands wettest and warmest year on record (records going back to 1900).[21]	Chapter 10 Air Quality

[18] *IPCC (2021) Climate Change 2021: The Physical Science Basis* <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>
[19] *Government of Ireland (2020) Climate Status Report for Ireland 2020* <https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf>
[20] *Irelands Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World* <https://www.epa.ie/publications/monitoring-assessment/climate-change/irelands-climate-change-assessment-volume-1.php>
[21] https://www.met.ie/2023-confirmed-as-irelands-wettest-year-on-record

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
	Due to the moderating influence of the North Atlantic, Ireland has, and will continue to, experience much milder air temperatures as compared to mainland Europe and other continental countries.[22] However, this moderating influence could be in jeopardy if the Atlantic Meridional Overturning Circulation (AMOC) continues to weaken[23]. The AMOC is a large system of ocean currents responsible for carrying warm water from the tropics into the North Atlantic and the strength of this current is a function of global mean temperature. The weakening of this current would counterbalance the warming effects of climate change creating instability for local ecosystems, agriculture, and fisheries.	
Precipitation	Climate change is impacting precipitation patterns in the Northern European region, with a range of observable effects including increased precipitation, more extreme precipitation events, seasonal variations and impacts on hydrological regimes[24]. Precipitation has been measured systematically in Ireland since the late 19th century and is a key indicator of changes in the climate; measurements and analysis of rainfall are essential for assessing the effects of climate change on the water cycle, water balance and for flood mitigation. Met Éireann highlights that it is already observing these trends, with the national annual average rainfall over the period 1991-2020 being approximately 1,288mm, which represents an increase of 7% from the previous 30-year monitoring period (1961-1990)[25]. Irelands Climate Averages 1991-2020 Summary Report obtained averages for the annual, seasonal and monthly number of rain days (number of days with rainfall ≥ 0.2 mm), wet days (number of days with rainfall ≥ 1 mm) and very wet days (number of days with rainfall ≥ 10 mm). Over the period 1991-2020, on an annual basis, the average number of rain days ranges from 201 days to 272 days; the average number of wet days ranges from 147 days to 226 days; and the average number of very wet days ranges from 22 days to 68 days.	Further detail on rainfall and evaporation data is provided in Section 9.3.2 in Chapter 9 Hydrology and Hydrogeology.

[22] https://www.met.ie/climate/what-we-measure/temperature#:~:text=The%20moderating%20influence%20of%20the,mild%20winters%20and%20cool%20summers.
[23] IPCC (2019) IPCC Special Report on the Ocean and Cryosphere in a Changing Climate Chapter 6. Extremes, Abrupt Changes, and Managing Risk <https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/08_SROCC_Ch06_FINAL.pdf>
[24] IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>
[25] Department of Housing, Local Government and Heritage (2024) Irelands Climate Averages 1991-2020 Summary Report <https://edepositireland.ie/handle/2262/108695>

Climate variable	Summary of current baseline environment	Relevant EIAR chapter (if applicable)
Wind and Storms	Climate change is impacting wind patterns in the Northern European region with a range of observable effects including increased wind speeds, changes in wind direction and seasonal variations[26]. Irelands Climate Averages 1991-2020 Summary Report identifies that the annual mean hourly wind speed ranges from 9 knots at Shannon Airport to 15 knots at Malin Head. Winds are generally strongest in the northwest of the country. The strongest winds are observed during the winter months and range from 10 knots at Shannon Airport to 18 knots at Malin Head. The lightest winds are observed during the summer months and range from 8 knots at Valentia Observatory to 13 knots at Malin Head. In late 2023 and early 2024, Ireland experienced a very active storm season; the county was affected by 13-14 severe storms[27]. In 2025 there has been 5 no. named storms at the time of writing, with Storm Eowyn, occurring in January 2025, reaching hurricane force winds (maximum wind speed recorded as 42km/h).[28] The increased frequency and intensity of storm events will lead to associated increases in precipitation (see above). As stated in 'Air Temperature' above, the AMOC has a moderating influence on Europe, however as identified by the IPCC, the strength of the AMOC is directly correlated to global mean temperature, and as global mean temperature increases, the AMOC will weaken[29]. The weakening of this current would result in increased storm activity in Northern Europe.	N/A

[26] *IPCC (2021) Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf>*
[27] *Met Éireann (2024) Human-caused Climate Change Brings Increased Storm Rainfall <https://www.met.ie/human-caused-climate-change-brings-increased-storm-rainfall>*
[28] *Met Éireann Strom Centre https://www.met.ie/climate/storm-centre*
[29] *IPCC (2019) IPCC Special Report on the Ocean and Cryosphere in a Changing Climate Chapter 6. Extremes, Abrupt Changes, and Managing Risk <https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/08_SROCC_Ch06_FINAL.pdf>*

11.3.1.3 Existing Greenhouse Gas Emissions

Greenhouse gas emissions arise from a large majority of anthropogenic activities. The main sectors which release emissions in Ireland are detailed in Section 1.1.2.6 of Appendix 11-1 Climate Legislation Policy and Guidance. These sectors include:

- Electricity
- Transport
- Built Environment
  - Residential
  - Commercial
- Industry
- Agriculture
- Land Use, Land Use Change, and Forestry (LULUCF)[1]
- Other (F-Gases, Waste, Petroleum refining)
- Unallocated savings

The most recent inventory report for Ireland, National Inventory Report 2025 (NIR 2025)[30], was published in 2025 and refers to the greenhouse gas inventory timeseries for the years 1990-2023. From 1990-2001, total emissions of greenhouse gases (excluding LULUCF) increased steadily from 55,231.5 $ktCO_2e$ in 1990 to 71,476.9 $ktCO_2e$ in 2001, which is the highest level of greenhouse gas emissions ever reported in Ireland. Emissions then plateaued until 2008 with estimates ranging from 69,032.5 $ktCO_2e$ to 71,213.8 $ktCO_2e$. There was then a sharp decrease from 69,032.5 $ktCO_2e$ in 2008 to 58,582.4 $ktCO_2e$ in 2011. In 2023, total emissions of greenhouse gases including indirect emissions from solvent use (excluding LULUCF) in Ireland were 54,934.4$ktCO_2e$, which is 1.4% lower than emissions in 1990. Emissions in 2023 at 54,934.4 $ktCO_2e$ are 6.8% lower than 2022, and the lowest level in the time series.

The Electricity sector accounted for the bulk of the CO_2 emissions in 2023 (57.1%), Agriculture contributed 36.2%, while a further 5.2% emanated from Industrial Processes and Product Use and 1.5% was due to Waste. Emissions of CO_2 accounted for 61.1% of the national total in 2023, with CH_4 and N_2O contributing 28.9% and 8.%, respectively. The combined emissions of fluorinated gases (HFC, PFC, SF_6 and NF_3) accounted for 1.2% of total emissions in 2023.[31]

11.3.2 Future Environment

Ireland is experiencing climate change in line with global trends, with current projections, detailed below, indicating that these effects will intensify in the coming decades. The baseline environment, detailed in the above sections, will undergo significant shifts, influencing Ireland's environment, economy, and society. Predicted changes include rising temperatures, altered precipitation patterns, and increased frequency of extreme weather events.

Visible changes in global climate are evident worldwide, with climate change projections suggesting further, more pronounced impacts in the future. These impacts will have wide-ranging effects on both natural and man-made environments across various sectors and regions, resulting in socio-economic repercussions. Referred to as the 'costs of inaction,' these economic impacts of climate change are increasingly influencing policy discussions[32]. It has become clear that even if greenhouse gas emissions were to cease immediately, climate alterations would persist for many decades. Therefore, alongside

[30] *EPA (2024) National inventory Report 2025* <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/Ireland's-NID-2025.pdf>
[31] *Ibid.*
[32] *European Environment Agency (2007) Climate change: the cost of inaction and the cost of adaptation* <https://www.eea.europa.eu/publications/technical_report_2007_13/download>

efforts for mitigation, it's imperative to develop effective adaptive strategies (adaptation) to mitigate damages or seize opportunities arising from climate change.

This section provides a description of the future predictions for climate change.

11.3.2.1 Data sources

A review of literature and data relating to climate change in Ireland was undertaken and utilised to provide an overview of the future baseline environment. The following key data sources were reviewed:

- High-resolution Climate Projections for Ireland – A Multimodel Ensemble Approach (report No. 339)[33]
- Climate Status Report for Ireland 2020[34]
- Climate Ireland[35]

11.3.2.1.1 *Physical Environment*

This section describes the future baseline for the Site's physical environment under the Representative Concentration Pathways (RCP) 8.5 high emission scenario. RCPs represent climate change scenarios used in modelling the possible future climate evolution, and are based on a wide suite of assumptions, to specify the greenhouse gas concentrations that will result in defined radiative forcing by 2100. The RCP 8.5 combines assumptions about high population and relatively slow income growth with modest rates of technological change and energy intensity improvements, leading in the long term to high energy demand and greenhouse gas emissions in absence of climate change policies. Compared to the total set of RCPs, RCP 8.5 thus corresponds to the pathway with the highest greenhouse gas emissions[36]. The physical environment of the Proposed Project under the RCP 8.5 scenario is discussed under the following headers:

- Air Temperature;
- Precipitation and Flood Risk;
- Wind and Storms.

Air Temperature

Annual surface air temperatures[37] in Ireland are now approximately 1°C higher than they were in the early 1900's (2013 – 2022 period relative to 1903 - 1912).

The upward trend in air temperatures is predicted to continue for all seasons: annual air temperatures may increase by over 3°C by the end of the 21st century relative to a 1976 to 2005 reference period under an RCP 8.5 high emission scenario[38].

Met Éireann projections[39] indicate an increase of 1–1.6°C in mean annual temperatures in Ireland, with the largest increases seen in the east of the country. Warming is enhanced for the extremes (i.e. hot or cold days), with highest daytime temperatures projected to rise by 0.7–2.6°C in summer and lowest night-time temperatures to rise by 1.1–3°C in winter. Averaged over the whole country, the number of

[33] *EPA Research (2020) High-resolution Climate Projections for Ireland – A Multimodel Ensemble Approach* <https://www.epa.ie/publications/research/climate-change/Research_Report_339_Part1.pdf>
[34] https://www.epa.ie/publications/research/climate-change/Research_Report_386.pdf
[35] https://www.climateireland.ie/
[36] *Climate Change (2011) A scenario of comparatively high greenhouse gas emissions* <https://link.springer.com/article/10.1007/s10584-011-0149-y>
[37] https://www.epa.ie/publications/monitoring--assessment/climate-change/irelands-climate-change-assessment-volume-1.php
[38] *Irelands Climate Change Assessment (2023) Volume 1 Climate Science – Ireland in a Changing World*
[39] https://www.met.ie/climate/climate-change#Reference3

frost days (days when the minimum temperature is less than 0°C) is projected to decrease by 62% for the RCP 8.5 high emissions scenario[40,41].

Precipitation and Flood Risk

Climate change is expected to have a significant impact on Ireland's precipitation patterns. Ireland is predicted to experience greater seasonality in precipitation, with more extreme fluctuations between wet and dry periods. Winter and autumn are anticipated to see increased rainfall, while spring and summer are projected to become drier, leading to more frequent droughts. The EPA's climate projections indicate that very wet days (i.e., days with more than 30mm of rainfall) will become more common, increasing by 31% under a high emissions scenario (RCP 8.5).

Due to Ireland's location in the west of Europe, exposure to Atlantic storms is of concern and this is particularly the case in the context of rising sea levels which will enhance the impacts of storm surges.[42]

Extreme rainfall events, such as those currently expected only once every 50 years, could become twice as frequent by the end of the century. This means more frequent flooding risks, particularly during the winter months[43]. Further information on flood risk is presented in the section below.

Flood Risk

Chapter 9 Hydrology and Hydrogeology, and the accompanying Flood Risk Assessment (FRA) (Appendix 9-1) detail the flood risk of the Proposed Project. Based on the information provided in the stated documents, the areas of the Proposed Project at risk of flooding were identified.

There are no recurring or historic flood incidents are recorded within the Proposed Project; the closest mapped historical flood event is ~5km downstream of the Site at the confluence of the Knockahorrea East stream and the Feale River at Rockchapel. This event was recorded in August 1986 (Flood ID: 2414). The closest mapped recurring flood event is mapped ~7km downstream of the Site along the R578 on the Glenlara River, near its confluence with the Dalua River. According to the Area Engineer Notes for Newmarket, the R578 road flooding occurs along a stretch of ~1km, resulting from high flows in River Dalua (Flood ID: 5153).

The GSI Maximum Historic Groundwater Flood Map, produced based on flood extents for the 2015/2016 winter flood event, does not record any groundwater flood zones within the Site, the Proposed Offsetting Lands, or in the surrounding areas.

Catchment Flood Risk Assessment and Management (CFRAM)[44] mapping has not been completed for the area of the Proposed Project. The closest CFRAM mapping to the Site has been completed along the Dalua River to the southeast of Newmarket town, ~11km to the southeast. The closest CFRAM mapping to the Proposed Offsetting Lands has been completed along the River Maine at Castleisland.

There is a slight risk of pluvial flooding at the Proposed Project due to the presence of impermeable blanket peat soils. However, the risk is very low as drainage moves relatively freely as a result of the sloping topography and the existing drainage. Fluvial flood modelling was also completed in order to

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[40] *Nolan, P. 2015. EPA Report: Ensemble of Regional Climate Model Projections for Ireland. EPA climate change research report no. 159. EPA: Wexford.*
[41] *O'Sullivan, J., Sweeney, C., Nolan, P. and Gleeson, E., 2015. A high-resolution, multi-model analysis of Irish temperatures for the mid-21st century. International Journal of Climatology. doi: 10.1002/joc.4419.*
[42] https://www.epa.ie/our-services/monitoring--assessment/climate-change/climate-ireland/impact-of-climate-change-on-ireland/climate-hazards/coastal-flooding.
[43] *EPA (2005) Climate Change Regional Climate Model Predictions for Ireland <*https://www.epa.ie/publications/research/climate-change/climate-change-regional-climate-model-predictions-for-ireland-.php*>*
[44] *CFRAM is Catchment Flood Risk Assessment and Management. The national CFRAM programme commenced in Ireland in 2011 and is managed by the OPW. The CFRAM Programme is central to the medium to long-term strategy for the reduction and management of flood risk in Ireland.*

consider future climate scenarios where the potential effects of climate change can increase rainfall. The National Indicative Fluvial Flood Mapping mid-range future scenarios models flood extents based on a 20% increase in rainfall and the high-range scenario models flooding based on a 30% increase in rainfall. As stated in the FRA both modelled flood extents demonstrate similar flooding as seen in the Present-Day Scenario. Therefore the Proposed Project site is unlikely to be significantly impacted by future climate change.

The FRA concludes that the overall risk of flooding posed by the Proposed Project and associated works within the site is very low. In addition, the risk of the Proposed Project contributing to downstream flooding is also very low. The long-term plan for the Site is to retain and slow down drainage water rates prior to release. Robust drainage measures on the Site will include swales, silt traps, check dams, settlement ponds and buffered outfalls. Please refer to the Chapter 9 of the EIAR for further details.

Wind and Storms

Future climate and weather predictions indicate a slight reduction in mid-century (2041 – 2060) average wind speeds around Ireland (-2.47% for RCP 8.5 high emissions scenario compared to the 1981 – 2000 baseline), with these decreases being more pronounced during the summer months[45]. Predictions also point towards less frequent, but more intense storm activity around Ireland. Correspondingly, projections indicate a decrease in average and extreme wave heights towards the end of the century, but an increase in the frequency and severity of storm surges in coastal regions of western Ireland, particularly in winter months[46]. Storm surge levels over a 20-to-30-year return period are anticipated to increase by up to 9cm by 2100[47].

11.3.2.2 Greenhouse Gas Emissions Projections

In its approach to decarbonisation, the EU has split greenhouse gas emissions into two categories, the Emissions Trading System (ETS) and the non-ETS. Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 42% by 2030, relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 42% in greenhouse gas emissions is achieved at EU-level[48].

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation (ESR[49]). This established binding annual greenhouse gas emission targets for Member States for the period 2021–2030. Please see Section 11.2.1 above and Section 1.1.1.9 of Appendix 11-1 for further details on the EU ESR.

Considerable progress has been made in the decarbonisation of the Electricity Sector, with emissions falling 22% between 2022 and 2023. This reduction in emissions is due to an increase in the share of renewable electricity generation, from 38.6% to 40.7% from 2022 to 2023, with wind energy accounting for 33.7% of electricity supply.[50]

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[45] https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/windspeed/
[46] https://www.epa.ie/publications/research/climate-change/research-339-high-resolution-climate-projections-for-ireland-.php
[47] https://www.climateireland.ie/impact-on-ireland/future-climate-of-ireland/waves–surges/
[48] *Department of the Environment, Climate and Communications (2023) - Climate Action Plan 2024* https://www.gov.ie/en/publication/79659-climate-action-plan-2024/
[49] *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris There was a significant drop in emissions from the Energy Industries sector between 2022 and 2023 (down 2.1 Mt CO2eq or 21.4%). This reduction in emissions was partly due to a 12-fold increase in the amount of imported electricity (9.5% of electricity supply in 2023), in combination with an increase in the share of renewable energy from 38.6% in 2022 to 40.7% in 202Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance)*
[50] *Department of the Environment, Climate and Communications (2025) - Climate Action Plan 2025*

The Environmental Protection Agency (EPA) publish Ireland's greenhouse gas emission projections and at the time of writing, the most recent report, *'Ireland's Greenhouse Gas Emissions Projections 2024-2055'*[51] was published in May 2025. The report includes an assessment of Ireland's progress towards achieving its emission reduction targets out to 2030 set under the ESR.

The EPA has produced two scenarios in preparing these greenhouse gas emissions projections: a "With Existing Measures" (WEM) scenario and a "With Additional Measures" (WAM) scenario. These scenarios forecast Irelands greenhouse gas emissions in different ways. The WEM scenario assumes no additional policies and measures, beyond those already in place by the end of 2023. This is the cut off point for which the latest national greenhouse gas emission inventory data is available. The WAM scenario has a higher level of ambition and includes government policies and measures to reduce emissions such as those in Ireland's Climate Action Plan 2024 that are not yet implemented. As implementation of policies and measures occurs, they will be migrated into the WEM Scenario. Please note, CAP25 is not specifically referenced in this report as it had yet to be published during the preparation phase of the 2024-2055 projections. A review was undertaken and there are no significant additional measures in CAP25 therefore no major omissions in these projections.

The EPA Emission Projections Update notes the following key trends:

- Ireland is not on track to meet the 51% emissions reduction target by 2030 (as compared to 2018 levels) based on most up to date EPA projections which include many of Climate Action Plan 2024 measures
- The first two carbon budgets (2021-2030), which aim to support achievement of the 51% emissions reduction goal, are projected to be exceeded by a significant margin
    - Carbon Budget 1 to be exceeded by a margin of 8 to 12 $MtCO_2eq$
    - Carbon Budget 2 to be exceeded by a margin of 77 to 114 $MtCO_2eq$ (with carryover from Carbon Budget 1)
- Sectoral emissions ceilings for 2025 and 2030 are projected to be exceeded by the Buildings, Electricity, Industry and Transport Sectors and met by the Other sector
    - Please note, a direct comparison of emissions in the Agriculture sector against its Sectoral Emission Ceiling is no longer viable due to significant refinement of the Agriculture inventory
- From 21.4 $MtCO_2eq$ in 2018, total emissions from the Agriculture sector are projected to be between 18.0 and 21.6 $MtCO_2eq$ in 2030 (a 16% reduction in WAM and 1% increase in WEM)
    - Without full implementation of all planned policies and measures, there will be a net increase in emissions in this sector by 2030.
- Transport emissions are projected to decrease from 12.3 $MtCO_2eq$ in 2018 to between 9.7 $MtCO_2eq$ and 11.2 $MtCO_2eq$ in 2030 (a 9 to 21% reduction).
- From 10.6 $MtCO_2eq$ in 2018, emissions from the Energy Industries sector are projected to decrease to between 3.4 and 4.4 $MtCO_2eq$ in 2030 (a 59 to 68% reduction)
    - Renewable energy generation at the end of the decade is projected to range from 69 to 68% of electricity generation
- Emissions from the Energy Industries sector are projected to decrease by between 57 and 62% over the period 2022 to 2030
    - Renewable energy generation at the end of the decade is projected to range from 69 to 80% of electricity generation
- Total emissions from the LULUCF sector are projected to increase over the period 2018 to 2030 by between 1.5 and 3.8 $MtCO_2eq$ (an increase of 39 to 95%)
- Ireland is not projected to meet its EU target, set under the Effort Sharing Regulation, of a 42% emissions reduction by 2030 (compared to 2005) even with flexibilities applied

[51] *EPA (2025) Ireland's Greenhouse Gas Emissions Projections 2024-2055*

- Under the WEM Scenario Ireland is projected to receive a 9.5% emission reduction from 2005 levels by 2030
- Under the WAM Scenario Ireland is projected to achieve a 21.7% emission reduction from 2005 levels by 2030.

11.3.3 Summary

As outlined in the preceding sections, Ireland is and will continue to experience climate change in line with global trends, with current projections indicating that these effects will intensify in the coming decades. The design of the Proposed Project considered the potential climate change effects under both the baseline and future environment and it is considered that the Proposed Project will not be negatively impacted by climate change, nor will it have a negative impact on climate change over its 10-year design horizon.

Further information on the vulnerability of the Proposed Project to major accidents and natural disasters is detailed in Chapter 16 Major Accidents and Natural Disasters.

11.4 Calculating Carbon Losses and Savings from the Proposed Project

11.4.1 Background

In addition to the combustion of fossil fuels, greenhouse gases are also released through natural processes such as the decomposition of organic material (which is composed of carbon). Bogs and peatlands are known to store large amounts of carbon. Due to the waterlogged nature of these habitats, stored carbon is not broken down and released into the atmosphere. The construction of wind farms on bog and peat habitats may affect the natural hydrological regime, thus exposing and drying out the peat and allowing the decomposition of carbon. It is therefore necessary to demonstrate that any wind farm constructed on such sites saves more carbon than is released. The Proposed Lifetime Extension is predominantly overlain by blanket peat; the Proposed Offsetting Lands is situated on agricultural land and peatland with small sections being covered by coniferous forestry located on commercial forestry and agricultural land. For this reason, the carbon balance between the use of renewable energy and the loss of carbon stored in the peat will be assessed in this section of the EIAR.

CO_2 emissions occur naturally in addition to being released with the burning of fossil fuels. All organic material is composed of carbon, which is released as CO_2 when the material decomposes. Organic material acts as a store of carbon. Peatland habitats have a significant capacity to store organic carbon. The vegetation on a peat bog slowly absorbs CO_2 from the atmosphere when it is alive and converts it to organic carbon. When the vegetation dies, in the acidic waterlogged conditions of bogs and peatlands, the organic material does not decompose fully, and the organic carbon is retained in the ground.

The carbon balance of wind farm developments in peatland habitats has attracted significant attention in recent years. When developments such as wind farms are proposed for peatland areas, there will be direct impacts and loss of peat in the area of the development footprint. There may also be indirect impacts where it is necessary to install drainage in certain areas to facilitate construction, or from the reinstatement of extracted peat. The works can either directly or indirectly allow the peat to dry out, locally, which permits the full decomposition of the stored organic material with the associated release of the stored carbon as CO_2. It is essential therefore that any wind farm development in a peatland area saves more CO_2 than is released.

The original EIAR for the Existing Taurbeg Wind Farm did not include a discussion on carbon losses and savings. The below assessment includes for this carbon loss assessment. Please note, under a

precautionary scenario all carbon losses associated with the Proposed Project and those from the Exiting Taurbeg Wind Farm turbines were calculated with 2025 emission factors rather than 2006 emissions factors (i.e., when the Existing Taurbeg Wind Farm was constructed). Please see Appendix 11-2 Carbon Calculations for further information on carbon calculations for the Proposed Project.

11.4.2 Methodology for Calculating Losses

During wind farm construction, carbon is lost as a result of peat excavation and peat drainage. The amount of carbon lost can be estimated using default values from the IPCC (IPCC, 1997) as well as by more site-specific equations derived from the scientific literature and updated emission factors. Carbon gains due to habitat improvement and site restoration are calculated in a similar fashion.

A methodology was published in June 2008 by scientists at the University of Aberdeen and the Macauley Institute with support from the Rural and Environment Research and Analysis Directorate of the Scottish Government, Science Policy and Co-ordination Division. The document, '*Calculating Carbon Savings from Wind Farms on Scottish Peat Lands'*, was developed to calculate the impact of wind farm developments on the soil carbon stocks held in peat. This methodology was refined and updated in 2011 based on feedback from users of the initial methodology and further research in the area. The web-based version of the carbon calculator, which supersedes the excel based versions of the tool, was released in 2016. Please note, the web-based version of the carbon calculator is currently not available, the Macauley Institute has supplied a worksheet of the calculator (Version 2.14.0) which has been used to complete the following carbon loss assessment. The tool provides a transparent and easy to follow method for estimating the impacts of wind farms on the carbon dynamics of peatlands. Previously guidance produced by Scottish Natural Heritage in 2003 had been widely employed to determine carbon payback in the absence of any more detailed methods.

Although the loss of carbon fixing potential from plants on peat land is not substantial, it is nonetheless calculated for areas from which peat is extracted and the areas affected by drainage. The development of a wind farm requires the construction of infrastructure, i.e., turbines and associated foundations and hardstands, internal site roads, construction compounds, etc. and, on a site such as the Proposed Offsetting Lands, this requires peat excavation resulting in the loss of the carbon-fixing potential of the associated vegetation. The determination of the carbon losses associated with the carbon-fixing potential is calculated from the area affected by a wind farm (both directly by removal of peat and indirectly by drainage, the annual gains due to the carbon fixing potential of the peatland, and the time required for habitat restoration. The amount of carbon lost is estimated using default values from the IPCC (IPCC, 1997) as well as by more site-specific equations derived from the scientific literature and updated emission factors.

Peatlands are essentially unbalanced systems. When flooded, peat soils emit less carbon dioxide but more methane than when drained. In waterlogged soils, carbon dioxide emissions are usually exceeded by plant fixation, so the net exchange of carbon with the atmosphere is negative and soil carbon stocks increase. When soils are aerated, carbon emissions usually exceed plant fixation, so the net exchange of carbon with the atmosphere is positive. As there is no construction proposed as part of the Proposed Lifetime Extension, there will be no carbon losses associated as a result of construction of turbines on peatlands. Please refer to the original planning application for the Existing Taurbeg Wind Farm (CCC Ref 02/3608) for further information on the construction phase of the Existing Taurbeg Wind Farm.

As part of the Proposed Offsetting Measures, deforestation of approximately 105.5ha of existing forestry is proposed to allow for the creation of habitat of approximately 123.3ha for hen harrier. At present, coniferous forestry at the Proposed Offsetting Lands is subject to cycles of felling and afforestation, typical of plantation forestry crops which limits the nature and longevity of the resulting timber produced. As stated in Table 5 of the Felling and Reforestation Policy[52] permanent removal of forestry

[52] *Felling and Reforestation Policy, Forest Service, Department of Agriculture, Food & the Marine, Ireland (2017) https://assets.gov.ie/96814/4830fc08-0227-4504-83fa-2fd90a7942f2.pdf*

may be considered and alternative afforestation is not required under a scenario whereby overriding environmental considerations are applied, such as protecting habitats and species as qualifying interests with SACs and SPAs. In this scenario, the Proposed Offsetting Lands are located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, with Hen Harrier being the qualifying interest of the SPA. Restoring the forested areas within the Proposed Offsetting Lands to dry heath aligns also with the conservation objectives for the SPA[53], with one of the targets being to restore the extent and quality of heath, and bog associated habitats to support targets relating to hen harrier population size, productivity rate and spatial utilisation. Therefore, if planning permission for the Proposed Project is granted, the Applicant commits to consultation with the Forestry Service and NPWS to discuss afforestation requirements prior to the granting of any felling licence associated with the removal of forestry at the Proposed Offsetting Lands. Under a precautionary approach, the carbon losses associated with the loss of 105.5ha of existing forestry have been calculated and are detailed in Table 11-6 below.

Where possible, carbon emissions, or losses, associated with embodied carbon of material used for the Proposed Project and associated transport movements have been identified. Embodied carbon refers to the emissions associated with procuring, mining and harvesting raw materials, the transformation of those materials into construction products, transporting them to Site, installation of these materials during a construction phase, and the subsequent replacement, removal, and disposal of these materials upon decommissioning.[54] These carbon losses have been completed with the use of the Transport Infrastructure Ireland (TII) Carbon Tool (TII 2022)[55]. The TII Carbon Tool is customised for road and light rail projects in Ireland, using the most up to date emission factors from recognised sources during the construction, maintenance and operation of TII projects in Ireland.

Section 15.2.5.5.1 in Chapter 15 of this EIAR outlines traffic generation numbers relative to the decommissioning of the Proposed Lifetime Extension, the details of which have been utilised to determine the emissions associated with these activities and are included in Appendix 11-2.

11.4.3 Carbon Losses and Savings Calculations

11.4.3.1 Carbon Losses

In relation to emissions associated with embodied carbon and associated transport movements, the TII Carbon Tool has been utilised to assess the impacts of the Proposed Project in terms of potential carbon losses, associated with the operational and decommissioning phase.

A copy of the outputs is provided as Appendix 11-2 of this EIAR, *'Carbon Calculations'*. Where available and relevant, site-specific information was inserted into the online carbon calculators. Otherwise, default values were used.

The main CO_2 losses due to the Proposed Project are summarised in Table 11-6.

[53] *Conservation Objectives for Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, NPWS 2022: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004161.pdf*
[54] *Irish green Building Council – What is embodied carbon?* <https://www.igbc.ie/what-is-embodied-carbon/>
[55] *Transport Infrastructure Ireland Carbon Tool for Road and Light Rail Projects: User Guidance Document* https://www.tiipublications.ie/library/GE-ENV-01106-01.pdf

Table 11-6 CO_2 Losses from the Proposed Project

Origin of Losses	CO_2 Losses (tonnes CO_2 equivalent) of the Proposed Project	
	Expected	Maximum
Existing Taurbeg Wind Farm Carbon Losses		
Losses due to turbine life (e.g. manufacture, construction, decommissioning)	18,496	19,524
Losses due to backup	4,699	4,903
Losses due to reduced carbon fixing potential	69	143
Losses from soil organic matter	2,979	6,517
Sub-Total	**26,243**	**31,087**
Proposed Lifetime Extension Carbon Losses		
Losses associated to embodied carbon of decommissioning phase materials	142.4	142.4
Losses associated to decommissioning phase transport movements	0.7	0.7
Sub-Total	**143**	**143**
Proposed Offsetting Measures Carbon Losses		
Losses due to forestry felling	13,927	14,328
Sub-Total	**13,927**	**14,328**
Total	**40,313**	**45,558**

The worksheet models and online tools calculate that the Existing Taurbeg Wind Farm and the Proposed Project will give rise to 40,313 tonnes of CO_2 equivalent losses. Of this total figure, losses due to turbine life account for 18,496 tonnes, or 46%. Losses due to backup account for 4,699 tonnes or 12%. Losses due to reduced carbon fixing potential accounts for 0.2% or 69 tonnes. Losses from soil organic matter account for 2,979 tonnes or 7%. Losses due to the embodied carbon of decommissioning phase materials is 142.4 tonnes or 0.4%. Losses due to decommissioning phase transport movements equates to 0.7 tonnes or 0.002%. Losses due to forestry felling (i.e., the deforestation of the Proposed Offsetting Lands) directly account for 13,927 tonnes, or 35%.

The values discussed above are based on the assumption that offsetting activities will not take place as part of the Proposed Project. As detailed in Appendix 7-7, a Hen Harrier Offsetting Plan for the Proposed Project has identified habitat creation activities such as restoring existing hedgerow and scrub for hen harrier, implementing grazing regime to create foraging and nesting opportunities for hen harrier prey species, and establishing linear strips of wildlife cover that will take place. This will serve to improve the carbon sequestration potential of the land within the Proposed Project. Therefore, the actual CO_2 losses for associated with the Proposed Project are expected to be lower than the values detailed in Table 11-6 over the lifetime of the Proposed Project.

The figure of 0.7 tonnes of CO_2 arising from transport movements associated with construction activities associated with the Proposed Project is calculated based on the assumption that material will be imported locally and assumes that each HGV or LGV will be carrying material at its full capacity where applicable (i.e., 25 tonnes). Details on the assumptions made for the modelling of embodied carbon and construction phase transport emissions are included in Appendix 11-2.

The values discussed above are based on the assumption that the hydrology of the Proposed Lifetime Extension are not restored during decommissioning of the Existing Taurbeg Wind Farm. As detailed in the Decommissioning Plan, Appendix 4-3, all 11 no. turbines will be dismantled and removed offsite in a similar manner to how they will be transported to the Site originally. It is not intended to remove the concrete foundations from the ground as it is considered that its removal will be the least preferred options in terms of having potential effects on the environment. The associated foundations will be backfilled and covered with soil material. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible with no environmental impact associated with leaving the ducting in situ. It is intended to remove fencing, transformers and all associated electrical plant and components from the Site. It is intended that the substation hardstanding area will be left in-situ and allowed to revegetate naturally. Taking into account the proposals incorporated in the Decommissioning Plan, the actual CO_2 losses are expected to be lower than the values detailed in Table 11-6.

11.4.3.2 Carbon Savings

The Proposed Lifetime Extension will continue to feed renewable energy to the national grid and result in carbon dioxide emissions reductions. While the carbon losses assessment considered both the Existing Taurbeg Wind Farm and the Proposed Project, the carbon savings assessment focuses solely on the 10-year extended operational life of the Proposed Lifetime Extension. The Existing Taurbeg Wind Farm, operational for 19 years at the time of writing, has consistently provided renewable energy during that period to the national grid. Emissions associated with the Existing Taurbeg Wind Farm during construction and operation are assumed to have been offset by its 19-year operational life to date. Therefore, the carbon savings and offset period discussed below relate exclusively to the Proposed Lifetime Extension.

A simple formula can be used to calculate carbon dioxide emissions reductions resulting from the generation of electricity from wind power rather than from carbon-based fuels such as peat, coal, gas and oil. The formula is:

$$CO_2 \text{ (in tonnes)} = \frac{(A \times B \times C \times D)}{1000}$$

where: A = ... The rated capacity of the wind energy development in MW

B = ... The capacity or load factor, which takes into account the intermittent nature of the wind, the availability of wind turbines and array losses etc.

C = ... The number of hours in a year

D = ... Carbon load in grams per kWh (kilowatt hour) of electricity generated and distributed via the national grid.

For the purposes of this calculation, the rated capacity of the Proposed Lifetime Extension is assumed to be 25.3 MW (based on 11 No. 2.3 MW turbines).

A load factor of 0.37 (or 37%) has been used for the Proposed Lifetime Extension [56]

The number of hours in a year is 8,760.

A conservative figure for the carbon load of electricity generated by natural gas in Ireland was sourced from Sustainable Energy Authority Ireland's (SEAI) December 2023 report, '*Energy in Ireland.*'[57] The provisional emission factor for electricity generated in Ireland in 2023 was 229.9gCO_2/kWh.

The calculation for carbon savings is therefore as follows:

$$CO_2 \text{ (in tonnes)} = \frac{(25.3 \times 0.37 \times 8{,}760 \times 229.9)}{1000}$$

$$= 18{,}852 \text{ tonnes per annum}$$

Based on this calculation, **18,852** tonnes of carbon dioxide will be displaced per annum from the largely carbon-based traditional energy mix by the Proposed Lifetime Extension. Over the proposed continued 10-year lifetime of the Proposed Lifetime Extension, **188,523** tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation. Based on the carbon losses presented above in Section 11.4.3.1, approximately 14,070 tonnes of CO_2 will be lost to the atmosphere due to the Proposed Project. This represents 3% of the total amount of carbon dioxide emissions that will be offset by the Proposed Lifetime Extension. The 14,070 tonnes of CO_2 that will be lost to the atmosphere due to the Proposed Project will be offset by the operation of the Proposed Lifetime Extension in approximately 8.9 months of operation.

As detailed in Appendix 7-7, the Hen Harrier Offsetting Plan, will take place as part of the Proposed Project. The Hen Harrier Offsetting Plan identifies the appropriate methodologies for deforestation in identified 'Areas' within the Proposed Offsetting Lands, restoration of farmland, and forestry replanting as per commitments to be agreed with the NPWS and Forest Service should the Proposed Project receive planning permission.

11.5 Likely Significant Effects and Associated Mitigation Measures

11.5.1 'Do-Nothing' Effect

If the Proposed Project were not to proceed, the existing wind farm would be decommissioned in accordance with the conditions of the current planning permission.

If the Proposed Project were not to proceed, the opportunity to further significantly reduce emissions of greenhouse gas emissions, including carbon dioxide (CO_2), oxides of nitrogen (NO_x), and sulphur dioxide (SO_2) from fossil fuels to the atmosphere would be lost. The opportunity to contribute to Ireland's commitments under the Paris Agreement and EU law would also be lost. This would be a long-term slight negative effect.

If the Proposed Offsetting Measures were not to proceed, existing land use of plantation forestry and agricultural practises within the Proposed Offsetting Lands would continue and the Proposed Offsetting

[56] *Eirgrid, 2022 Enduring Connection Policy 2.3 Constraints Report for Solar and Wind* <https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf> *The Site is located within the E wind region for Ireland with an associated capacity factor of 37%.*
[57] *SEAI (December 2023) Energy in Ireland 2023 Report* <https://www.seai.ie/sites/default/files/publications/Energy-in-Ireland-2023.pdf>

Measures would not take place. This would likely result in a long-term, imperceptible, negative effect on climate.

11.5.2 Proposed Lifetime Extension

11.5.2.1 Greenhouse Gas Emissions

The Proposed Lifetime Extension will generate energy from a renewable source. This energy generated will offset energy and the associated emission of greenhouse gases from electricity-generating stations dependent on fossil fuels, thereby having a positive effect on climate. As detailed in Section 11.4.3.2 above, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over its proposed 10-year extended operational lifespan. The Proposed Lifetime Extension will assist in reducing carbon dioxide (CO_2) emissions that would otherwise arise if the same energy were otherwise to be generated by conventional fossil fuel plants. This is a medium-term significant positive effect on climate.

Some potential medium-term slight negative impacts, which are not significant, that may occur during the extended operational phase of the Proposed Project is the release of carbon dioxide to the atmosphere due to maintenance and monitoring activities.

Transport

In the unlikely event that a turbine blade is damaged and must be replaced during the extended operational phase, the transport of new blades, which will occur on specified routes only (see Section 4.6.2 in Chapter 4 of this EIAR), will also give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be medium-term and slight only, given the quantity of greenhouse gases that will be emitted and will be restricted to the duration of the extended operational phase, therefore it is not significant. Mitigation measures to reduce this impact are presented below.

Emissions resulting from routine maintenance at are included in the section above.

Waste Disposal

Waste is not proposed to be generated on the Site during the extended operational phase, any waste that does arise will be minimal and any impact will be short-term and imperceptible, which is not significant. Waste management will be carried out in accordance with '*Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects'* (2021) produced by the EPA.

Mitigation

- Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements

Residual Effect

Following implementation of the mitigation measures above, the Proposed Lifetime Extension will have a medium-term slight positive effect on Climate. However, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed 10-year extended operational lifespan. Therefore, while there will be greenhouse gas emissions associated with the operational phase of the Proposed Lifetime Extension (i.e. arising from maintenance and monitoring activities detailed above), these will be offset within the proposed 10-year extended operational lifespan.

Medium-term slight positive effect on Climate as a result of reduced greenhouse gas emissions.

Significance of Effects

Based on the assessment above there will be no significant effects.

11.5.3 Proposed Offsetting Measures

11.5.3.1 Greenhouse Gas Emissions

The Proposed Offsetting Measures will involve management of lands required for the offsetting of potential effects of the continued operation of the Existing Taurbeg Wind Farm on hen harrier. Proposed Offsetting Measures include the incorporation of a grazing regime, establishment of linear strips of wildlife cover, scrub and hedgerow enhancement, and the cessation of fertiliser use containing nitrate.

Some potential medium-term slight negative impacts, which are not significant, that may occur during the Proposed Offsetting Measures is the release of carbon dioxide to the atmosphere due to maintenance and monitoring activities (assessed in '*Transport'* below), and the removal of carbon fixing vegetation and habitat associated with Proposed Offsetting Measures.

Transport

As discussed in Section 15.2.4.3 in Chapter 15 of the EIAR, there will be approximately 20 days when 5 HGV loads or 10 HGV movements per day will be generated to and from the Proposed Offsetting Lands during the Proposed Offsetting Measures. This will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be short-term and imperceptible only, given the quantity of greenhouse gases that will be emitted and will be restricted to the duration identified in Chapter 15, therefore it is not significant. Mitigation measures to reduce this impact are presented below.

Waste Disposal

Waste is not proposed to be generated on site as a result of the Proposed Offsetting Measures, any waste that does arise will be minimal and any impact will be short-term and imperceptible, which is not significant. Waste management will be carried out in accordance with '*Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects'* (2021) produced by the EPA.

Mitigation

- Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.

- When stationary, delivery and on-site vehicles will be required to turn off engines.
- Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements

Residual Effects

Following implementation of the mitigation measures above, the Proposed Offsetting Measures will have a long-term imperceptible positive effect on Climate due to natural regeneration of the Proposed Offsetting Lands which will form a permanent part of the landscape, after the Existing Taurbeg Wind Farm and Proposed Lifetime Extension has been decommissioned.

Significance of Effects

Based on the assessment above there will be no significant effects

11.5.4 Decommissioning Phase

11.5.4.1 Greenhouse Gas Emissions

Proposed Project

The Proposed Lifetime Extension is expected to have a lifespan of 10 years. Following the end of the operational life of the wind farm, the wind farm will be decommissioned fully as agreed with the Planning Authority.

Upon decommissioning of the Existing Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components would be separated and removed off-site for recycling. Please note, the Applicant has made a commitment not to send turbine blades to a landfill. Turbine foundations and hardstands would remain in place underground and will be covered with earth and reseeded as appropriate. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration. It is proposed to leave access roads in-situ, as these are in use by the participating landowners to access their lands and as existing walking trails. Underground cables will be removed, and the ducting left in place.

The Proposed Offsetting Lands will form a permanent part of the landscape, after the Existing Taurbeg Wind Farm and Proposed Lifetime Extension has been decommissioned. The Proposed Offsetting Measures that were put in place during the extended operational life will, including the restoration of existing hedgerow and scrub for hen harrier, implementing a grazing regime to create foraging and nesting opportunities for hen harrier prey species, and establishing linear strips of wildlife cover, will result in a long-term imperceptible positive effect on climate.

Transport

The transport of wind farm infrastructure away from the Site will give rise to greenhouse gas emissions associated with the transport vehicles and exhaust emissions. This effect will be short-term and slight only, given the quantity of greenhouse gases that will be emitted and will be restricted to the duration of the decommissioning phase. Mitigation measures to reduce this impact are presented below.

Waste Disposal

Waste will arise from excavation and unavoidable waste associated with decommissioning a wind farm, including damaged materials and packaging waste, and the removal of the 11 no. turbines which make up the Existing Taurbeg Wind Farm.

The relevant components will be removed from Site for re-use, recycling or waste disposal. Any structural elements that are not suitable for recycling will be disposed of in an appropriate manner. All lubrication fluids will be drained down and put aside for appropriate collection, storage, transport and disposal. Any materials which cannot be re-used or recycled will be disposed of by an appropriately licenced contractor.

A Waste Management Plan (WMP) will be agreed with the relevant authority prior to decommissioning of the Existing Taurbeg Wind Farm. The WMP will outline the best practice procedures during the decommissioning and the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of decommissioning. Disposal of waste will be seen as a last resort. Please see Section 3.10 of Appendix 4-3 Decommissioning Plan for further detailed on the WMP.

This potential impact will be short-term and slight only, given the quantity of greenhouse gases associated with the generation and management of these waste streams that will be emitted to the atmosphere and will be restricted to the duration of the decommissioning phase. Waste management will be carried out in accordance with *Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021) produced by the EPA.

Mitigation

- All vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.
- When stationary, delivery and on-site vehicles will be required to turn off engines.
- Turbines and other infrastructure will be transported from the Site on specified routes only unless otherwise agreed with the Planning Authority (see Section 15.1 Chapter 15 for details)
- The Decommissioning Plan (Appendix 4-3) includes a Waste Management Plan (WMP) which outlines the best practice procedures that will occur during the decommissioning phase relating to waste material. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of the decommissioning of the Proposed Lifetime Extension.
    - Section 3.10 of the Decommissioning Plan (Appendix 4-3) for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor,
    - The MRF facility will be local to the Site where possible to reduce the amount of emissions associated with vehicle movements.
    - Disposal of waste will be seen as a last resort

Residual Effect

Following implementation of the mitigation measures above, residual effects of greenhouse gas emissions arising from the decommissioning phase of the Existing Taurbeg Wind Farm will have a short-term, imperceptible, negative effect. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from decommissioning phase activities will have a permanent, imperceptible, negative effect on Climate.

When considering these greenhouse gas emissions within the context of the national Electricity Sector Emissions Ceilings detailed in Section 11.2.2, Carbon Budget 1 (2021-2025) has an Electricity Sector budget of 40 MtCO2eq. and Carbon Budget 2 (2026-2030) has an Electricity Sector budget of 20 MtCO2eq for large-scale deployment of renewables. As detailed in Section 11.4.3.2, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed extended 10-year lifespan of the Proposed Lifetime Extension. Therefore, while there will be greenhouse gas emissions associated with the decommissioning of the Existing Taurbeg Wind Farm, this will take place under the Electricity sector emissions ceiling and will can be considered as offset by the operation of the Proposed Lifetime Extension within its operational life.

Significance of Effects

Based on the assessment above there will be no significant effects.

11.6 Cumulative Assessment

The potential for impact between the Proposed Project, and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Project will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans in the vicinity of the Site, as set out in Chapter 2 of this EIAR. Please see Section 2.11 of Chapter 2 for cumulative assessment methodology.

The other plans and projects considered as part of this cumulative effect assessment are presented in Appendix 2-3 of this EIAR. The cumulative project list was prepared following a review of planning files (An Bord Pleanála and Local Authority files), EPA search engines, development plans and National Roads Office/Transport Infrastructure Ireland road projects. Relevant developments with potential cumulative effects on Climate, within 1km of the Site being considered. This is in line with the Transport Infrastructure Ireland (TII) Publication Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01107, December 2022.

11.6.1 Proposed Lifetime Extension

The nature of the Proposed Lifetime Extension is such that it will have a medium-term, slight, positive impact on climate. However, as noted above, the Proposed Lifetime Extension will offset the **14.070** tonnes of CO_2 associated with the Proposed Project that will be lost to the atmosphere (Section 11.4.3.1) in approximately **8.9** months of operation.

When considering these greenhouse gas emissions within the context of the Electricity Sector Emissions Ceilings detailed in Section 11.2.2, Carbon Budget 1 (2021-2025) has an Electricity Sector budget of 40 MtCO2eq. and Carbon Budget 2 (2026-2030) has an Electricity Sector budget of 20 MtCO2eq for large-scale deployment of renewables. As detailed in Section 11.4.3.2, the Proposed Lifetime Extension will displace carbon dioxide from fossil fuel-based electricity generation, over the proposed extended 10-year lifespan of the Proposed Lifetime Extension. Therefore, while there will be greenhouse gas emissions associated with the extended operational phase of the Proposed Project, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Lifetime Extension within its extended operational life. Thus, there will be no cumulative effects arising on climate from the Proposed Project and other permitted or proposed projects and plans in the area as set out in Section 2.11 in Chapter 2 of this EIAR.

11.6.2 Proposed Offsetting Measures

The nature of the Proposed Offsetting Measures is such that it will have a long-term imperceptible positive effect on climate. However, as noted above, the Proposed Lifetime Extension will offset the

14.070 tonnes of CO_2 associated with the Proposed Project that will be lost to the atmosphere (Section 11.4.3.1) in approximately **8.9** months of operation.

Please note, while there will be greenhouse gas emissions associated with the Proposed Offsetting Measures, this will take place under the Electricity sector emissions ceiling and will be offset by the operation of the Proposed Lifetime Extension within its extended operational life. Thus, there will be no cumulative effects arising on climate from the Proposed Offsetting Measures and other permitted or proposed projects and plans in the area as set out in Section 2.11 in Chapter 2 of this EIAR.

11.6.3 Decommissioning Phase

During the decommissioning phase of the Existing Taurbeg Wind Farm and other permitted or proposed projects and plans in the area as set out in Section 2.11 in Chapter 2 of this EIAR, that are yet to be constructed, there will be greenhouse gas emissions arising from the operation of vehicles and plant. These will be restricted to the duration of the decommissioning phase, and as such will give rise to emission over a short-term duration. However, once emitted to the atmosphere, the greenhouse gas emissions that will arise from decommissioning phase activities will have a permanent imperceptible negative effect on Climate.

The works required during the decommissioning phase are described in Section 4.7 in Chapter 4: Description of the Proposed Project.