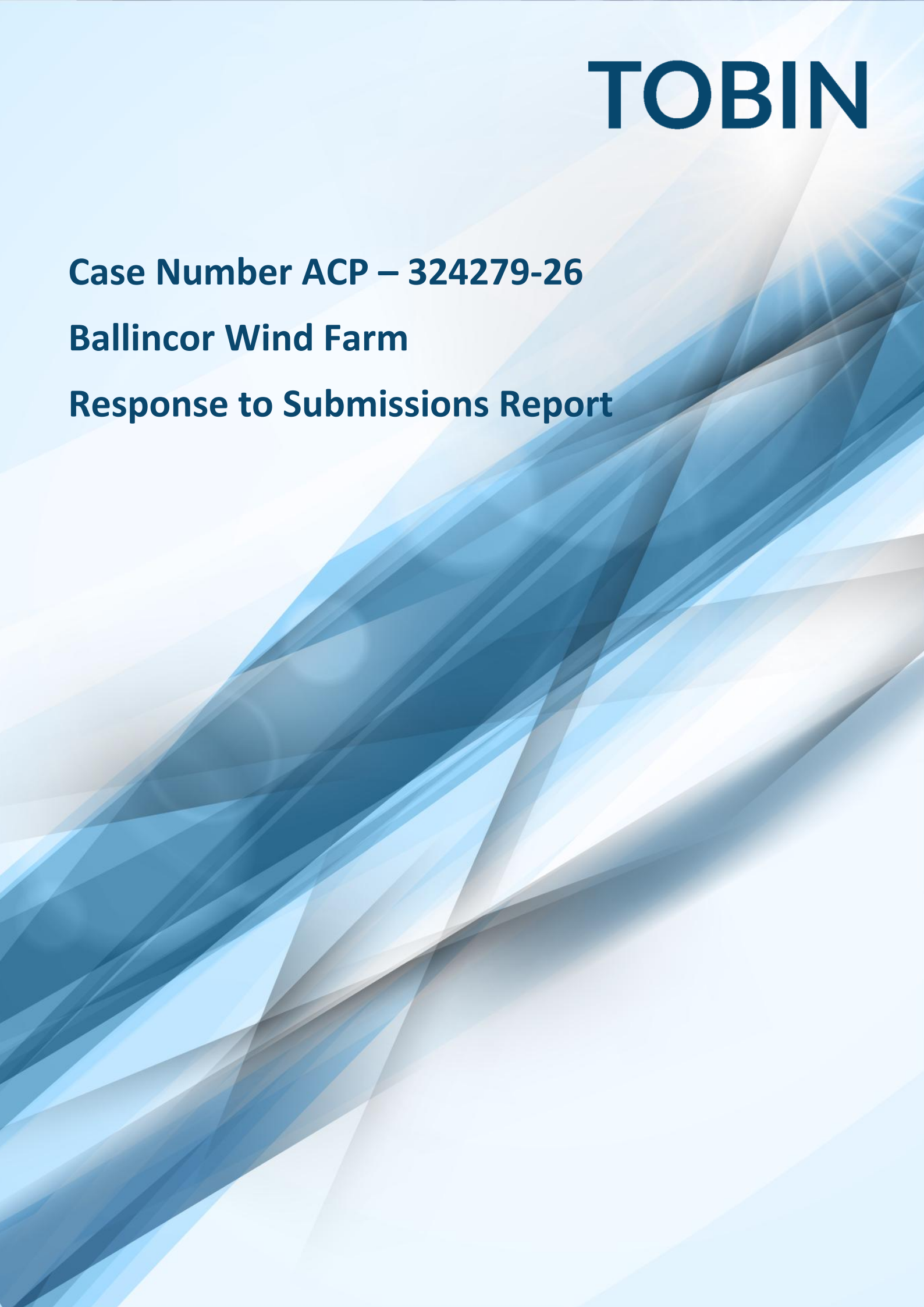




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Case Number ACP – 324279-26

Ballincor Wind Farm

Response to Submissions Report

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1. INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This report has been prepared in response to a letter from An Coimisiún Pleanála (ACP) dated 17th July 2026, inviting the applicant (RWE Renewables Ireland Limited) to respond to the prescribed bodies and 62 submissions received in respect of a planning application for the proposed Ballincor Wind Farm development in County Offaly and Tipperary (ACP case number 324279-26). Please refer to Appendix 2 for the schedule of all observers who submitted observations.

We confirm that the following responses address all the matters raised by the observers listed in Appendix 2.

1.2 FORMAT OF RESPONSE

This response document firstly addresses the themes raised in the prescribed body submissions followed by the third-party submissions. Each theme in the third-party submissions is discussed in a specific section of this response. The submissions contain a large number of comments. Although many comments do not necessitate a response, it should not be taken that the applicant accepts or agrees with those comments. This submission has focused on the points raised under each theme where a response is warranted and may be helpful for ACP in making a determination on the application.

All specialists involved in the preparation of the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) have reviewed each of the individual observations and have provided a technical response to the items relevant to their area of expertise and EIAR chapter.

1.3 RELEVANT PLANNING CONTEXT

This section provides a short summary of the following key case law and government policy relevant to the proposed Ballincor Wind Farm:

- Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5
- Friends of Killymooney Lough -v- An Coimisiún Pleanála & Ors [No.2] [2025] IEHC 576
- Ireland's Large Energy User Action Plan (LEAP)
- Large Energy Users (LEU) Connection Policy CRU/2025236
- Energy Security in Ireland to 2030

Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5

The Supreme Court's judgment in *Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5*, was issued on 4th of February 2026, and provides important support for the proposed Ballincor Wind Farm insofar as it confirms that, in determining an application for renewable energy development, ACP must engage in a real and substantive way with the climate benefits of the project.

The judgement emphasises that renewable electricity and climate mitigation benefits of development must be expressly considered as part of the planning balance. At the same time, the Court made clear that Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended) does not create an automatic presumption in favour of every renewable energy project, but it does require that climate objectives be meaningfully addressed within the decision-making process.

The Climate Action and Low Carbon Development Act 2015 (as amended), outlines duties for certain bodies (which includes consenting authorities) under Article 15 (1) as follows:

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.*

In this regard, the proposed Ballincor Wind Farm is consistent with each of the matters identified in Section 15(1)(a)–(e) of the Climate Action and Low Carbon Development Act 2015, as amended, insofar as it would contribute to the delivery of renewable electricity, support national emissions reduction and climate neutrality objectives, and form part of the wider transition to a climate-resilient energy system:

Section 15(1) criterion	Response of proposed wind farm
<i>(a) The most recent approved climate action plan</i>	The proposed Ballincor Wind Farm aligns with the most recent approved Climate Action Plan, namely Climate Action Plan 2025, which identifies the transition to renewable electricity as a central part of Ireland's pathway to halving emissions by 2030 and achieving climate neutrality by no later than 2050. The Plan states that Ireland is to achieve 80% of electricity demand from renewable sources by 2030. In that context, a wind farm with a proposed capacity of between 61.6 MW and 77 MW, capable of generating clean electricity for over 36,690 to 45,860 households annually, would make a direct contribution to the delivery of additional renewable electricity generation capacity.
<i>(b) The most recent approved national long term climate action strategy</i>	The proposed Ballincor Wind Farm is also consistent with Ireland's Long-term Strategy on Greenhouse Gas Emissions Reductions, which sets out the pathway to achieving carbon neutrality by 2050 and includes the decarbonisation of the electricity sector as a key component of that transition. By increasing the supply of indigenous renewable electricity over the long term, the proposed wind farm would

	contribute to the structural decarbonisation of the national energy system.
<i>(c) The most recent approved national adaptation framework and approved sectoral adaptation plans</i>	The proposed Ballincor Wind Farm is capable of being advanced in a manner consistent with the National Adaptation Framework, published in June 2024, which provides the national strategy for adaptation measures and requires public bodies and infrastructure sectors to plan for climate resilience. While adaptation is distinct from mitigation, a well-sited and appropriately designed wind farm forms part of the resilient electricity infrastructure required in the context of climate change. The proposed wind farm also takes into account flood risk as part of climate change scenarios. On that basis, the proposed wind farm would support a more climate-resilient energy system, subject to detailed design and assessment.
<i>(d) The furtherance of the national climate objective</i>	The national climate objective under the 2015 Act, as amended, is for the State to pursue and achieve, by no later than 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy. The proposed Ballincor Wind Farm will support the furtherance of that objective by generating renewable electricity at utility scale and displacing electricity otherwise generated from fossil fuels. In doing so, it will contribute to the transition to a climate neutral economy and to the wider decarbonisation of Ireland's energy system.
<i>(e) The objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State</i>	The proposed Ballincor Wind Farm directly supports the objective of mitigating greenhouse gas emissions by increasing the supply of renewable electricity and reducing reliance on carbon-intensive generation. Given its proposed capacity of 61.6 MW to 77 MW and its ability to generate clean electricity for over 36,690 to 45,860 households annually, the development will make a material contribution to national emissions reduction efforts. In addition, by adding domestic renewable generation to the electricity system, the project also supports climate adaptation in a broader strategic sense by strengthening energy resilience and reducing dependence on fossil fuel-based supply.

Of note, Section 3 “Strategic Justification” of the submitted Planning Statement outlines EU and National level policy that clearly drives the need for this type of renewable energy development.

The need for the Proposed Project is driven by the following factors:

- A legal commitment from Ireland to limit greenhouse gas emissions under the Kyoto protocol to reduce global warming;
- A requirement to increase Ireland's national energy security as set out in Ireland's Transition to a Low Carbon Energy Future 2015-2030 Adopted Paper;

- 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 Renewable Energy Directive (EU) 2023/2413 (RED III));
- Provision of cost-effective power production for Ireland which would deliver local benefits;
- Increasing energy price stability in Ireland through reducing an over-reliance on imported gas; and
- The Proposed Project will also aid in bridging the gap of over 4 GW electricity shortfall in Ireland, in turn contributing towards achieving the CAP25 target of 9 GW of energy to be sourced from onshore wind by 2030. The current installed wind capacity at the end of 2024 is 4.8 GW according to Wind Energy Ireland.

Of relevance is the Energy White Paper – Ireland's Transition to a low Carbon Energy Future, as well as the target outlined under CAP24. Ireland faces significant challenges to meet its EU targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. The Proposed Project is critical to helping Ireland address these challenges as well as addressing the country's over-dependence on imported fossil fuels.

On a regional scale, RPO 44 of the Southern RSES states that:

'It is an objective to ensure the delivery of sustainable actions under the Rural Development Programme (RDP) 2014-20 and beyond in priority areas of innovation, bio-diversity restoration, water and soil management, renewable energy and waste management, carbon conservation and sequestration, diversification, job creation and ICT development in our rural areas'.

Additionally policy 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."

In conclusion, the Proposed Project will contribute towards international, EU, national, regional, and local policy regarding the reduction of dependence on fossil fuels, increased reliance on renewable energy and reducing emissions of GHGs. It will contribute to meeting the EU's challenging target of at least 42.5% renewable energy by 2030.

Friends of Killymooney Lough -v- An Coimisiún Pleanála & Ors [No.2] [2025] IEHC 576

In climate policy terms, the proposed Ballincor Wind Farm represents a form of development that directly supports the achievement of the State's statutory climate objectives and should be assessed in that context.

As referenced earlier, Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended, requires public bodies, so far as practicable, to perform their functions in a manner consistent with national climate goals.

In *Friends of Killymooney Lough v. An Coimisiún Pleanála*, the High Court made clear that this statutory framework is relevant to the exercise of consent functions, and that a development may properly be regarded as “compatible” where it contributes to those goals, including where it aligns with and assists implementation of the relevant Climate Action Plan. The High Court articulated three essential steps for projects that cause greenhouse gas emissions: 1. Identify net emissions, 2. Evaluate against targets, and 3. Evaluate practicability.

This reasoning is particularly supportive of renewable energy infrastructure such as the proposed wind farm. A wind farm is not simply a neutral form of development in climate terms; it is a project whose purpose is to facilitate decarbonisation of the electricity sector and to support delivery of the State’s legally recognised transition pathway.

This is important in the context of carbon budgets. Unlike forms of development that may give rise to significant operational greenhouse gas emissions, a wind farm is understood as infrastructure that assists in the reduction of reliance on fossil-fuel-based electricity generation. As such, it thereby supports compliance with the national carbon budget framework. Government policy expressly identifies the expansion of onshore wind energy as necessary to achieving the target of 80% renewable electricity by 2030 and for supporting the electricity sector’s carbon budget programme. In that way, the proposed wind farm does not consume carbon-budget headroom; rather, it contributes to the structural changes required for the State to remain within its carbon budget trajectory. The carbon-budget analysis in the case law therefore supports the grant of permission for the proposed Ballincor Wind Farm.

Large Energy User Action Plan (LEAP)

Ireland’s LEAP was published in January 2026 by the Department of Enterprise, Tourism and Employment and the Department of Climate, Energy and the Environment. LEAP is a Government strategy to facilitate future investment in energy intensive sectors, while unlocking Ireland’s renewable energy potential. LEAP will enable Ireland to attract investment from energy intensive sectors (e.g. data centres, Artificial Intelligence (AI), life sciences), driving the economy and innovation for future decades.

LEAP is a plan led approach, ensuring cross Government collaboration, that will align large energy users with Ireland’s national climate and energy targets. Through 17 enabling actions to be delivered over the next five years, it aims to address development barriers impacting large energy users and in particular regarding energy infrastructure.

Central to LEAP is the role of renewable energy: the plan explicitly aims to unlock Ireland’s renewable energy potential by co-locating large energy users with close access to renewable energy generation in designated green energy parks and prioritising developments that support renewable investment and grid efficiency.

It also seeks to ensure that growing industrial electricity demand is met, as far as possible, from renewables, reinforcing Ireland’s transition to a low-carbon energy system. Overall, renewables are not just a supporting element but a core condition of LEAP, shaping where and how future large-scale industrial growth can occur.

Energy Security in Ireland to 2030

The Irish Government's Energy Security in Ireland to 2030 outlines a new strategy to ensure energy security in Ireland for this decade while ensuring a sustainable transition to a carbon neutral system by 2050. This is extremely important given the current geopolitical issues and energy emergency.

This policy recognises that Ireland faces particular vulnerabilities due to its geographic isolation, heavy reliance on imported fossil fuels, and limited interconnection with other energy markets.

"Informed by the government's energy security policy objectives - to ensure energy is affordable, sustainable, and secure - the review considered the risks to oil, natural gas, and electricity. The report sets out that Ireland's future energy will be secure by moving from an oil- and gas-based energy system to an electricity-led system, maximising our renewable energy potential, flexibility and being integrated into Europe's energy systems. Meeting our climate, renewable, and energy efficiency targets through actions and measures set out in the annually updated Climate Action Plan will deliver this secure energy future"¹.

The development of the proposed Ballincor Wind Farm aligns with this approach and is capable of generating clean electricity for over 36,690 to 45,860 households annually. This would make a direct contribution to the delivery of additional renewable electricity generation capacity.

¹ <https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/energy-security-in-ireland-to-2030/>

2. RESPONSE TO PRESCRIBED BODIES

2.1 DoHLGH SUBMISSION

The DoHLGH submission advises that a condition to any planning grant should be that all mitigation measures outlined in the EIAR, NIS and all other relevant documents must be implemented in full. This is agreeable to the applicant.

2.1.1 Archaeology

Summary

A number of recommendations were made including the following:

- Pre-development archaeological testing before any ground disturbance.
- Appointment of a licensed archaeologist.
- Archaeological impact assessments and mitigation strategies where remains are found.
- Inclusion of archaeological constraints and protections within the Construction Environmental Management Plan (CEMP).
- Final archaeological reporting after completion of works.
- Preservation of archaeological features either in situ or by excavation and recording.

Response

All archaeological mitigation measures identified in Chapter 13 of the EIAR will be implemented.

Pre-development archaeological testing by a suitably qualified and licensed archaeologist will be completed before any site preparation, groundworks, topsoil stripping, site investigations, or construction works commence.

All archaeological measures included in the Appendix 2-3 CEMP will be implemented. As set out in the CEMP, Archaeological monitoring will be carried out under licence to the National Monuments Service of the DoHLGH.

2.1.2 Otter

Summary:

Concerns were raised by the DoHLGH regarding the assessment and reporting of Otter, which is a Qualifying Interest for the nearby River Shannon Callows SAC (000216). The submission notes that the Biodiversity Chapter of the EIAR identified a potential Otter holt along a drainage ditch in 2022, located approximately 80 metres (m) from an access track, but highlighted that this information was not considered within the NIS. Furthermore, the DoHLGH highlighted that no scientific reasoning or camera trap data were provided to support the conclusion that the holt was inactive during subsequent update surveys between 2023 and 2025. Additionally, concerns were raised regarding the proposed mitigation and recommended that preconstruction surveys be undertaken no more than one month prior to the commencement of works, rather than the proposed twelve-month window included in the submitted documents.

Response:

The DoHLGH 's comments regarding the reporting of Otter activity and the phasing of the associated mitigation measures are acknowledged. While the holt data was considered, presented, and evaluated within Chapter 6 - Biodiversity of the EIAR, the omission of this potential (inactive) Otter holt was not included in the NIS and its omission does not change the conclusions of the NIS.

The holt in question, was recorded as a potential holt during the initial 2022 surveys, where it was classified as inactive due to the absence of any evidence of use, such as spraints, footprints, or fresh bedding. Subsequent follow up visits between 2023 and 2025 confirmed continued inactivity due to the lack of any evidence of use by Otter. Notwithstanding the absence of evidence of occupation during repeated surveys, the Applicant adopted a precautionary approach and treated the feature as a potential active Otter resting site within the EIAR. The feature was therefore considered a key ecological feature within Chapter 6 – Biodiversity and included within the impact assessment, and appropriate mitigation measures were developed on the assumption that Otter activity could occur in the vicinity during the lifetime of the Proposed Project.

In addition to the pre-construction surveys outlined in the EIAR, all works within proximity to watercourses and drainage features will be supervised by a suitably qualified Ecological Clerk of Works (ECoW). The ECoW will confirm the status of any identified Otter resting sites and ensure that the required exclusion zones and species protection measures are implemented prior to the commencement of works.

In relation to the concerns raised around the omission of the Otter holt within the NIS, the Otter survey results were not considered relevant data which would inform the Appropriate Assessment considering the significant downstream distance of the holt from the River Shannon Callows SAC (ca. 22km downstream). Otters' territory ranges in Ireland have been recorded to range between 6–15 km along rivers (Reid et al., 2013 and Bailey & Rochford, 2006)^{2,3}. Therefore, considering the holt was located outside the range of 15 km, it was deemed that the potential holt, and associated Otter which may use the holt, did not form part of the population designated within the SAC. Additionally, the lands within the Proposed Project site were not considered supporting ex-situ sites for Otter designated within River Shannon Callows SAC. Therefore, disturbance to the holt was instead considered within Chapter 6 – Biodiversity.

The DoHLGH's recommendation to adjust the preconstruction survey timeline will be adopted if conditioned as part of the planning process. The timeline originally included in the mitigation sections of the EIAR and NIS, state that surveys would be undertaken no more than twelve

² Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013). National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

³ Bailey, M. and Rochford J. (2006) Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

months prior to the start of construction which follows guidance within the NRA (2006) guidance⁴.

In accordance with standard legal procedures, if active breeding or resting sites are identified during these preconstruction checks within the 150 m disturbance zone, works in that area will not proceed until a derogation licence is obtained from the National Parks and Wildlife Service and appropriate protective measures are implemented.

2.1.3 Invasive Species

Summary:

Concerns were raised by the DoHLGH regarding an inconsistency between the NIS and the EIAR around invasive species. The submission highlights that while Parrot-feather (*Myriophyllum aquaticum*) and Himalayan balsam (*Impatiens glandulifera*) were noted within the NIS, Canadian pondweed (*Elodea canadensis*) was identified within a Figure in the EIAR Biodiversity Chapter but omitted from the NIS. The DoHLGH also noted that despite the close proximity of the proposed wind farm boundary to Sharavogue Bog SAC, potential impact pathways for the introduction or spread of invasive species were not assessed within the NIS, and no associated mitigation was proposed.

Response:

The DoHLGH's comments regarding the alignment of data between the EIAR and the NIS, and the evaluation of potential impact pathways relating to invasive alien species, are acknowledged. However, it should be noted that Canadian pondweed is no longer listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations. Canadian pondweed was illustrated within Figure 6-5 of the EIAR but was not included within the assessment text as it is not currently listed on the Third Schedule. As such, it does not carry the same statutory reporting requirements as Parrots-feather or Himalayan balsam.

With regard to the potential impacts arising from the introduction or spread of invasive species, this was considered within the NIS. As outlined in Table 6-2 of the EIAR, no adverse effects on the qualifying interests or conservation objectives of Sharavogue Bog SAC were identified as a result of invasive species.

Further to this, the qualifying interests of Sharavogue Bog SAC comprise terrestrial bog habitats located upstream of the Proposed Project and associated works. No direct hydrological pathways were identified between the locations at which invasive species were recorded and the qualifying habitats of the SAC. Furthermore, the invasive species identified within the study area are aquatic and riparian species whose ecological requirements differ substantially from those of the terrestrial bog habitats for which the SAC is designated.

Consequently, the assessment concluded that the Proposed Project would not create a pathway through which the identified invasive species could be introduced to, or spread within, the qualifying habitats of Sharavogue Bog SAC. On this basis, no adverse effects on the integrity of

⁴ National Road Authority (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin : National Road Authority.

the SAC arising from invasive species were identified, and the conclusions of the submitted NIS therefore remain unchanged.

2.1.4 Hydrogeology connection and Sharavogue bog

Summary:

The DoHLGH questions the conclusion presented within the NIS and the EIAR that no hydrogeological connection exists between the Proposed Project and Sharavogue Bog SAC. Specifically, the DoHLGH notes that the assessment appears to rely primarily on a conceptual hydrogeological model and that it is unclear whether any site-specific groundwater monitoring was undertaken to verify this conclusion. Given the sensitivity of the qualifying habitats within the SAC, the DoHLGH considers that additional evidence is required to demonstrate, beyond reasonable scientific doubt, that no hydrological pathway exists that could adversely affect the conservation objectives of the SAC.

Response:

Sharavogue Bog SAC is located to the east of the River Brosna. The area is underlain by deep low permeability soils. Peatlands on the proposed wind farm site are not hydrological/hydrogeological connected to the raised bogs habitats to the east of the Little Brosna River. A summary of the distances to the Sharavogue Bog SAC and associated habitats are included in Table 2-1 below. The extent of the active raised bog habitats within the Sharavogue Bog SAC are controlled by the boundary conditions, i.e. lagg zone, former railway and drainage to the east and by the drainage (within the SAC) and face banks to the west. The lagg zone corresponds to a thin strip of fen peat located between the Raised bog and Basic Mineral soils/tills derived from limestones on Figure 8-2 and Figure 8-4 of the EIAR. Based on the details topography information, this is located at the base of steep hill in the townland of Rathbeg.

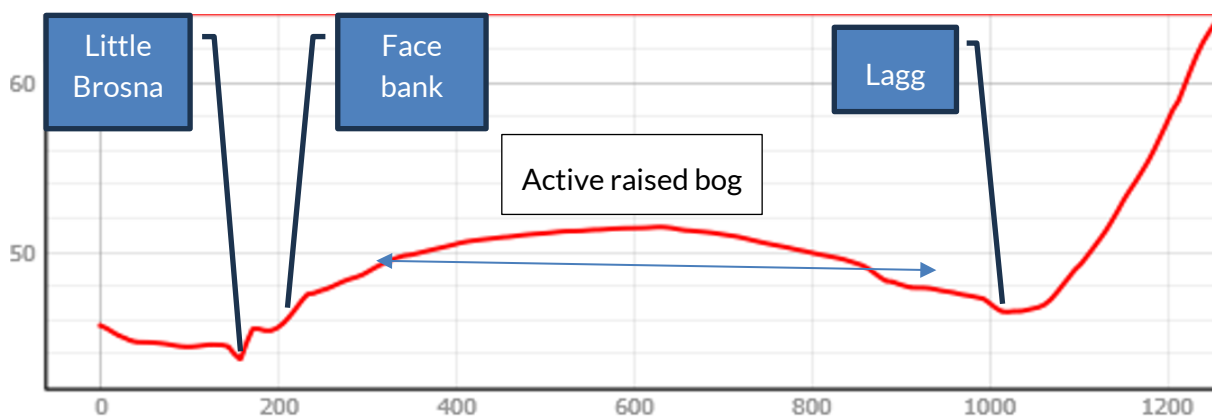


Figure 2-1 Summary Section NE from T8

Table 2-1 Summary of distances to Sharavogue bog habitats

Turbine	Distance River	Peatland habitats	Lagg fen area
T8	84m	266m to marginal /face bank ecotope.	850 m to Lagg area. The lagg is located at higher elevation than T8/T9 and the Little Brosna River. Ground water upwells at 48-52mOD and located between the elevated limestone tills at Rathbeg and Sharavogue bog.
T9	108m	311m to marginal /face bank ecotope.	910 m to lagg area. Lagg is located at higher elevation than T8/T9 (45mOD) and the Little Brosna River. Ground water upwells between 48-52mOD and located between the elevated limestone tills at Rathbeg and Sharavogue bog.

The conclusions presented within the NIS and the EIAR were informed by the hydrogeological assessment presented in Chapter 9 of the EIAR, which considered the geological, hydrogeological and topographical characteristics of the site and the surrounding landscape. This assessment concluded that groundwater flow paths within the study area are expected to be relatively short, reflecting the underlying bedrock characteristics and the absence of a regionally important aquifer. The Little Brosna forms a hydrological/hydrogeological boundary to the east of the proposed wind farm.

The assessment also considered the location and characteristics of Sharavogue Bog SAC and concluded that no hydrogeological connection exists between the Proposed Project and the qualifying habitats of the SAC. Consequently, no pathway was identified through which changes in groundwater flow associated with the Proposed Project could adversely affect the integrity of the site as defined by the conservation objectives and status of the site.

The conclusions of the NIS were not based solely on the application of a generic zone of influence but were informed by the conceptual site model developed as part of the hydrogeological assessment and by an evaluation of the potential pathways through which effects could arise. The lagg is located at higher elevation than T8/T9 and the Little Brosna River. The lagg area is located at a higher elevation to the east of the Little Brosna River. The lagg area is located between the elevated limestone tills at Rathbeg and Sharavogue bog and removed from the river and river flood plain. Ground water upwells the base of Rathbeg hill, at a higher elevation (48-52mOD) and over 850 m from the proposed turbines. Site specific groundwater monitoring indicated groundwater levels (0.3 – 1m bgl) to the west of the Little Brosna are lower at c43-44 m OD. The peat banks to the east of T4 shown evidence of desiccation. Sphagnum spp cover within 20 m of the peat bank is <10%. Active rehabilitation of the area to the east of T4 would have limited success with active turf cutting undertaken in the surrounding area.

On this basis, the submitted NIS concluded that no adverse effects on the integrity of Sharavogue Bog SAC would arise as a result of changes in groundwater flow, and the conclusions of the submitted assessment therefore remain unchanged.

2.1.5 Raised Bog Habitat

Summary:

The DoHLGH raises concerns regarding potential indirect effects on the Annex I habitat; Active Raised Bog [7110], occurring within the Proposed Project site. While no direct habitat loss is proposed, works, namely Turbine T4, occur in close proximity to the raised bog and associated cutover bog habitat. The DoHLGH considers that the potential for alterations to groundwater flow to indirectly affect the raised bog habitat has not been adequately demonstrated within the EIAR, noting that the Biodiversity Chapter relies on conclusions from the Hydrology and Hydrogeology Chapter without a specific assessment of effects on this habitat. Concerns are also raised that the location of T4 within adjacent cutover bog could constrain the future restoration of habitat surrounding the raised bog, and the DoHLGH recommends reconsideration of the turbine location.

Response:

Turbine T4 has avoided all areas of Raised Bog or degraded raised bog. T4 is located on an area of cutover turbary strips. The area to the east of T4 comprises a number of turbary strip which future turbary rights purchased as part of the Proposed Project. In the absence of the Proposed Project, these six turbary strips will revert to the previous turbary land use. The Proposed Project will prevent turbary extraction in c.3.01ha. In terms of future restoration/rehabilitation, areas of turbary and high bog outside of the proposed footprint could be rehabilitated/restored where a suitable scheme was available.

Extensive networks of drains are present on the cutover around the remaining raised bog. These drains are designed to facilitate turf-cutting and harvesting by draining the facebank and spread grounds adjacent to the bog. Water levels at the face bank are governed by the turbary drainage as the site is underlain by deep clayey tills (See Appendix 8-1). It is proposed to sheet pile through the cutover peat to the firm to stiff clayey glacial till effective eliminating groundwater inflows. The water levels in the remnant bog are therefore controlled by the surface water ponding at the base of the face banks.

The proposed SuDS drainage around the turbine will be maintained and will prevent drawdown of water levels. A total of 5 ha of degraded raised bog, located away from turbary strips, will be rehabilitated as part of the Proposed Project as outlined in Appendix 6-1 Biodiversity Enhancement Management Plan (BEMP) of the EIAR.

2.1.6 Air Quality

Summary:

The DoHLGH raises concerns regarding the assessment of potential air quality effects on Sharavogue Bog SAC, particularly the apparent inconsistency in the dust zone of influence applied within the NIS. The DoHLGH considers that potential dust effects beyond 50 m, including associated nitrogen deposition, have not been adequately assessed against the sensitivity and conservation objectives of the qualifying raised bog habitats. Concerns are also raised regarding reliance on existing habitat mapping and whether more recent survey

information should have been used to confirm the current extent of qualifying habitats within the SAC.

Response:

The DoHLGH's comments regarding potential air quality effects on Sharavogue Bog SAC are acknowledged. The assessment within the NIS considered construction-related dust having regard to the nature and location of the proposed works, the distribution of qualifying habitats and the relevant source-pathway-receptor relationships.

The reference within Section 5.1.14 to dust effects potentially occurring up to 250 m should be distinguished from the screening distance applicable specifically to ecological receptors. IAQM (2024) identifies ecological receptors within 50 m of the site boundary, or within 50 m of construction vehicle routes up to 250 m from the site entrance, for consideration in construction dust assessments. The 50 m zone of influence applied within the NIS was therefore based on the relevant ecological screening distance. The nearest mapped qualifying habitat within Sharavogue Bog SAC is approximately 220 m from potential dust-generating construction activities and over 1.5km from the site entrance and consequently outside this distance. Based on the APIS data, Nox concentrations are <3 ug/m³⁵ and Nitrogen Deposition for grid average are 6.4 kg/ha/yr. The main source of emissions is agriculture activity, which will be reduced within the proposed footprint during the construction and operational phase.

With regard to nitrogen deposition, construction generated dust and atmospheric nitrogen deposition represent separate impact pathways. Dust associated with the proposed works would principally comprise particulate material generated by earthworks, excavation, handling of soils and aggregates and vehicle movements. The generation of such dust does not, in itself, represent a source of atmospheric nitrogen deposition or indicate that the SAC specific nitrogen deposition target would be exceeded. Any potential nitrogen emissions associated with combustion sources, such as construction plant and vehicles, represent a separate air quality pathway.

The NIS relied upon the published NPWS conservation objectives and supporting habitat information for Sharavogue Bog SAC, which represent the official information available for the European site. The use of this data was therefore considered appropriate for the assessment.

On this basis, no pathway for adverse effects on the qualifying interests or conservation objectives of Sharavogue Bog SAC arising from construction-related dust was identified, and the conclusions of the submitted NIS remain unchanged.

In relation to cumulative effects the generation of electricity due to the installation of the wind farm will lead to indirect net savings in terms of NO_x emissions. The proposed wind farm is estimated to have an export capacity of between approximately 61.6 to 77 MW and an assumed capacity factor of 33%, therefore the power generation from the project is expected to be approximately a minimum of 178 GWh per annum.

⁵ Air Pollution Information System (2023) GIS map tool <https://www.apis.ac.uk/app>.

The minimum supply of 178 GWh of renewable electricity to the national grid will lead to a net saving in terms of NO_x emissions which may have been emitted from fossil fuels to produce electricity. Results, outlined in Table 10.9 of the EIAR, indicate that the impact of the proposed wind farm on Ireland's obligations under the National Emissions Reduction Directive are positive.

2.1.6.1 Construction Dust

In relation to the effects of construction dust on ecological receptors, the most appropriate guidance *Assessment of dust from demolition and construction* (2024 V2.2) from the Institute of Air Quality Management has been applied for this assessment as part of Chapter 10 Air Quality. As per the guidance, significant effects are most likely at receptors within 50 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles, up to 250 m from the site entrance. Therefore, outside these distances significant effects are unlikely. The assessment determined that the Sharavogue Bog SAC boundary is within 20 m of the wind farm site boundary and the Woodville Woods pNHA is within 20 m of the grid connection route, and that the sensitivity of the area to ecological impacts from construction dust is considered high (see Section 10.5.2 of Chapter 10 Air Quality). The assessment then determined that there is a high risk of dust-related effects on ecology (see Section 10.6.2.1 of Chapter 10 Air Quality), and construction dust management and mitigation measures appropriate for this level of risk were identified (see Section 10.7.2 of Chapter 10 Air Quality). These measures will ensure there are no significant effects on ecology both closest to the sources of construction dust, as well as ecology further than 50 m from the works.

2.1.6.2 Construction Traffic

In relation to the effects of construction traffic on ecological receptors, the most appropriate guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (2025) from Transport Infrastructure Ireland has been applied to determine the likelihood of a significant effect from construction traffic emissions to air. The guidance presents criteria for traffic volumes which trigger the need for a detailed quantitative assessment. Where traffic volumes are below these criteria, the guidance determines a significant effect is unlikely. It is only recommended to assess changes greater than 1,000 AADT. The assessment in Chapter 10 Air Quality determined that construction traffic volumes associated with the Proposed Project will be below these criteria and a quantitative assessment is not required, and effects on ecology will be not significant.

2.1.7 Marsh Fritillary Butterfly

Summary:

The DoHLGH raises concerns regarding the adequacy and age of the Marsh Fritillary survey data, noting that surveys were limited to larval web surveys undertaken in September 2023, with no adult surveys undertaken, and considers that updated surveys should have been completed. Concerns are also raised regarding the predicted loss of occupied habitat and the reliance on translocation of larval webs and Devil's-bit Scabious to reduce an initially significant effect to not significant, given uncertainty regarding the effectiveness of such measures. The DoHLGH considers that greater emphasis should be placed on avoidance, particularly through

relocation of the temporary construction compound away from occupied habitat, together with seasonal restrictions on works and early enhancement of surrounding habitat.

Response:

The DoHLGH's comments regarding the Marsh Fritillary survey effort, the application of the mitigation measures and their effectiveness are acknowledged.

The September 2023 surveys were undertaken during the larval web survey period and confirmed Marsh Fritillary breeding activity within two discrete areas of the Proposed Project site. The assessment therefore proceeded on the basis of confirmed presence and identified the affected areas as supporting Marsh Fritillary, rather than relying on an absence of records to exclude potential effects. While no adult surveys were undertaken, the identification of larval webs provides direct evidence of successful breeding and was used to inform the impact assessment. The current land management (grazing and grass topping) is suboptimal for the long-term management of Marsh Fritillary and thus no potential existed for Marsh Fritillary webs to be present during the 2025 surveys. Topping is required at present to prevent scrub (mainly gorse) encroachment.

It is acknowledged that the Proposed Project has the potential to directly affect occupied Marsh Fritillary habitat and that, prior to mitigation, a significant effect was identified. A comprehensive suite of mitigation measures was therefore incorporated into the Biodiversity Chapter, including pre-construction surveys, exclusion zones, management and enhancement of suitable wet grassland habitat, measures relating to Devil's-bit Scabious, supervision by the ECoW and post-construction monitoring. Translocation forms one component of this approach and was not relied upon as the sole measure for addressing potential effects. It forms part of a wider mitigation strategy that prioritises minimisation of habitat loss, protection of retained habitat, ecological supervision of works, habitat enhancement and post-construction monitoring.

The DoHLGH's recommendation regarding further avoidance of occupied habitat, particularly at the proposed temporary construction compound, is acknowledged. Where possible, the footprint of the temporary construction compounds will be minimised below the assessed area, however, it is not possible to relocate the temporary construction compounds due to other assessed constraints within the project site.

The DoHLGH's recommendations regarding the timing of works are also acknowledged. Pre-construction surveys by a suitably qualified ecologist/ECoW will be used to confirm the distribution of Marsh Fritillary and occupied habitat prior to works, with appropriate exclusion of occupied areas and timing of works to avoid sensitive stages of the species' lifecycle where required. Habitat management and enhancement measures should similarly be implemented at the earliest practicable stage to ensure the continued availability of suitable habitat.

2.1.8 Adequacy of Ornithological Survey Effort and Coverage

The DoHLGH's comments regarding the spatial distribution and seasonal duration of the baseline transect surveys are acknowledged. While it is recognised that the initial transect routes did not physically span the entirety of the Proposed Project site, these transects sample the full range of habitat types present within the broader landscape.

The chosen transect routes covered a variety of habitats located within the zone of influence of the Proposed Project. By monitoring these representative environments over a multiyear period, the survey programme established a scientifically valid baseline of the avian species composition and abundance expected within those habitat types.

Furthermore, the assessment did not rely on transect data in isolation. The wider study area was subject to extensive vantage point surveys, which provided visibility into areas where transects did not occur. This multiyear data was further supplemented during the 2025/2026 winter survey season by an expanded transect layout along with the addition of hen harrier roost and waterbird surveys. The combination of habitat representative sampling, vantage point visibility, and the addition of surveys provided a robust baseline sufficient to inform the impact assessment. Accordingly, the conclusions of the submitted Ornithology Chapter remain unchanged.

2.1.8.1.1 Effects of Turbine Aviation Lighting on Birds

Summary:

Concerns were raised regarding the potential effects of aviation obstruction lighting on birds, particularly in relation to nocturnal migration. It was noted that the submitted ornithological assessment did not specifically consider the potential influence of turbine lighting on bird behaviour or navigation.

Reference was made to published guidance on the effects of aviation obstruction lighting on birds, which identifies differences in the attractiveness of lighting types and outlines a range of mitigation measures that may reduce potential effects. It was recommended that the lighting design for the proposed wind farm should consider current best practice guidance and the available mitigation measures.

Response:

The comments regarding the potential effects of aviation obstruction lighting on birds are acknowledged.

The NatureScot guidance⁶ referenced in the submission is noted and the mitigation measures identified within that document have been reviewed. The guidance recognises that the potential effects of aviation lighting are species-specific and that the available evidence is derived largely from studies of nocturnally migrating passerines and burrowing seabirds, which are most susceptible. Burrow-nesting seabirds are not relevant to the Proposed Project, while the key ornithological receptors (KORs) identified comprise mostly of raptors, waders and waterbirds, which are not identified by the guidance as the groups principally susceptible to aviation lighting effects. On this basis, the specific lighting-related effects identified within the NatureScot guidance are not considered to represent a significant impact pathway for the KORs identified at the Proposed Project.

Wind turbines in Ireland are equipped with specific lighting for aviation and maritime safety, which are regulated by the IAA and the Commissioners of Irish Lights. The final

⁶ NatureScot (2020). The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures. NatureScot Information Note, Version 1.1, September 2020.

aviation lighting specification for the Proposed Project will be determined in accordance with the relevant aviation safety requirements.

2.1.9 Nocturnal, Dawn/Dusk and Migratory Bird Movements

Summary:

Concerns were raised regarding the adequacy of the survey programme in characterising nocturnal, dawn and dusk bird movements. It was noted that dedicated nocturnal surveys were not undertaken, despite the presence of wintering bird species, including Whooper Swan and Greenland White-fronted Goose, which may undertake movements between feeding and roosting areas during periods of reduced light.

Response:

The Department's comments regarding nocturnal, dawn and dusk bird movements are acknowledged.

A comprehensive bird survey programme spanning nine seasons (between 2020 and 2026) was undertaken to inform the baseline description within the Ornithology Chapter. While it is acknowledged that dedicated nocturnal methodologies were not systematically deployed across the entirety of the multi-year baseline period, the assessment relied on a robust combination of standard daytime vantage points, winter swan/geese foraging field surveys, targeted habitat suitability appraisals, and extensive desk-study data.

To ensure a robust assessment in line with best practice guidance, targeted supplementary field surveys were commissioned and completed during the final 2025/2026 survey season. This additional winter season surveys specifically incorporated dedicated dawn and dusk vantage point watches, alongside targeted Hen Harrier roost surveys. While it is acknowledged that this recent data does not fully replace the absence of dedicated nocturnal methodologies in the preceding seasons, the 2025/2026 survey results provide critical, localised verification of crepuscular flight activity and species movement dynamics across the Proposed Project site. This updated dataset reduces baseline uncertainty regarding commuting corridors for sensitive wintering species such as Whooper Swan and Greenland White-Fronted Goose.

As outlined in **Appendix 1** to this report, nocturnal surveys could provide additional information on the relative level of nocturnal movements of avian receptors. However, the collision risk model already makes an allowance for nocturnal activity through application of nocturnal activity rankings, which form a standard part of the collision risk modelling methodology. Therefore, an appropriate uncertainty analysis regarding the nocturnal bird activity was adequately incorporated within the collision risk model.

2.1.10 Barn Owl

Summary:

Concerns were raised regarding Barn Owl, given the location of the Proposed Project within an area identified as potentially sensitive for the species and the identification of a potential nest site in close proximity to a proposed turbine location. It was considered that targeted Barn Owl surveys should have been undertaken to support the conclusions of the assessment.

Response:

With respect to Barn Owl, the assessment did not rely solely on desk-study information. The suitability of habitats within and surrounding the Proposed Project site was considered, together with available published information and records for the species.

The predominantly nocturnal behaviour of Barn Owl was recognised as a limitation of the conventional daytime survey programme. No dedicated nocturnal Barn Owl surveys were undertaken, and this was considered as a limitation within the assessment rather than treating the lack of nocturnal observations as evidence of absence. The Chapter 7 Ornithology assessment considered available field observations alongside habitat appraisal, desk study information, consultation undertaken with BirdWatch Ireland, and published information on Barn Owl ecology (Section 7.4, Chapter 7).

The presence of breeding Barn Owl in the wider area, including in close proximity to the proposed turbines, indicates that the species may use the wider area for foraging. However, proximity to a breeding location does not in itself demonstrate regular use of the proposed turbine locations or establish a significant collision risk. As per Ruddock & Whitfield (2007)⁷, barn owl have a limit of disturbance at 50-100 m, with many nest sites not being disturbed until a human was within 10 m during the study. Collision related mortality is not likely to significantly impact this species, particularly given this species flies at low elevation (3-4 m) when foraging (Barn Owl Trust)⁸.

As outlined in section 7.6.3 of the EIAR, the proposed internal infrastructure will result in the loss of a relatively small proportion of habitat (c. 28.83 ha), equating to approximately 6% of the total Proposed Project site area. Of this, only a proportion comprises suitable open agricultural habitat that may be used for foraging (equating to approximately 4% of the total site area). Additionally, there will be no loss of known or suitable breeding habitat for this species, and there is a high availability of comparable suitable open agricultural habitat suitable for foraging within the wider surrounding area. It is considered that the potential effects on Barn Owl have been appropriately assessed and the conclusions of the submitted Ornithology Chapter remain unchanged.

2.1.11 *Bats*

Summary:

Concerns were raised surrounding the lack of transect surveys and activity surveys carried out at trees classed as PRF-I and bridge B08 identified as a roost. Additionally, the DoHLGH raised concerns that linear edge features being formed by access roads through conifer plantation (specifically T3) will increase suitability for bats and guide bats to turbine locations increasing risks of collision and barotrauma. The DoHLGH recommends further information be provided on this potential impact and address the increased risk with mitigation measures such as planting that will guide bats away from turbines or further curtailment.

Response:

⁷ Ruddock, M., Whitfield, D. A review of disturbance distances in selected bird species

⁸ <https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-wind-turbines/>



Active (transect) bat detection surveys are not a requirement of NatureScot (2021)⁹ or NIEA (2026)¹⁰ and are described as being useful in certain circumstances. BCT has also reduced the emphasis on active bat surveys in their general bat survey guidance (Collins 2023)¹¹.

Active bat surveys were carried out by O'Donnell Environmental in 2020 and 2021 on the proposed wind farm site to the extent that active bat surveys at night could be safely carried out given the nature of the site which contains open drains associated with active and historic peat harvesting and grazing animals.

Additionally, and following the completion of these historic transect surveys, Northern Irish guidance was released in the interim detailing that: “*The need for manual surveys should be assessed on a site by site basis by the commissioned ecologist*” (NIEA, 2022). This specific change has been retained in the most recent revision of the guidance (NIEA 2026)¹⁰. This data was not presented within the Bat Survey Report (O'Donnell Environmental, 2026) as the data exceeds the recommended lifespan (CIEEM, 2019)¹² and did not enhance understanding of bat usage of the proposed wind farm site relative to data provided by passive bat detectors. On this basis, and because of the reduced emphasis on transects in guidance more recently, the data was not presented.

However, in response to the query from the DoHLGH the data is presented and discussed. The 2020 and 2021 surveys are described in the accompanying Bat Ecological Memorandum (Appendix 3 to this report).

The results of active surveys were reflective of data gathered via robust multi-season passive monitoring surveys - the same species were recorded and activity by Common Pipistrelle and Soprano Pipistrelle was concentrated on areas with linear features. Bat activity was concentrated in locations along hedgerows and mature woodland - as was identified during passive monitoring.

For the most recent round of surveys carried out by O'Donnell Environmental in 2025, active bat surveys were not carried out for the above reasons and due to the significant, multi-annual dataset available for the site. Absence of active bat survey data is not considered to be a limitation in terms of understanding of bat usage of the site in this instance. For the avoidance of doubt, active (transect) surveys may be useful for determining flight paths, foraging locations, or mating behaviour but are not a recommended approach for the identification of roosts (Collins, 2023)¹¹.

The structure B08 was assessed as being of low suitability to bats and therefore not suitable for a ‘significant’ roost (following NatureScot, 2021)⁹ but in any event, structure B08 is situated outside of the search area for significant roosts as it relates to wind turbines. Consideration was given to the potential for direct or indirect effects to occur on any bats which may be roosting in the structure during GCR installation. A mitigate-by-design approach was adopted, and O'Donnell Environmental engaged with project designers in order to avoid the potential for

⁹ NatureScot (2021) Bats and onshore wind turbines – survey, assessment and mitigation.

¹⁰ NIEA (2026). Guidance on Bat Surveys, Assessment & Mitigation for Onshore Wind Turbines Developments – Version 1.4, Natural Environment Division, July 2026.

¹¹ Collins (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition.

¹² CIEEM (2019) Advice Note on the Lifespan of Ecological Reports & Surveys.

effects. No direct or indirect disturbance to any bats roosting here would occur as potential impacts are avoided through appropriate HDD design. The feature was adequately inspected by a bat-licensed Ecologist using an endoscope, high-powered torch, and gathering of bat DNA which identified roosting by Brown Long-eared Bat. Given the absence of potential effects, any further surveys (e.g. bat emergence survey) or characterisation of the roost is not considered necessary.

In relation to wind farm proposals, NatureScot recommends that features with potential for 'significant' usage by bats are identified within 200 m plus one rotor radius of the site boundary. A cautious approach was taken, and potential features including trees, were sought within a distance of 300 m from turbine locations. In the case of trees, significant usage would equate to PRF-M categorisation following Collins (2023)¹¹. All potential bat roosting features which would be directly or indirectly affected by the proposal were appropriately considered during daytime, visual surveys.

As trees are frequently used on a transitional and nomadic basis by roosting bats, Marnell et al. (2022)¹³ recommends a risk-based approach, in which trees with a high probability of use by bats only should be subject to survey. Trees with lower probability of being used by bats include "coniferous plantation with no specimen trees" and "young trees with simple growth form and little damage" (Marnell et al., 2022)¹³. Such trees would be categorised as 'none' or PRF-I following Collins (2023)¹¹ in term of suitability for roosting bats, the latter classification relating to features in trees which are limited in capacity to individual bats or small numbers of bats and have no likelihood of being used for significant numbers of bats e.g. maternity sites. In relation to PRF-I trees, Collins (2023)¹¹ recommends that no further surveys are required.

Trees within the proposed works area are largely associated with commercial forestry and were assessed as having negligible potential to support roosting bats. Eight trees were categorised as PRF-I and following Collins (2023)¹¹, no further surveys are required, and measures were included which will be implemented during felling to avoid any effects on bats. One PRF-M tree, which will not be directly affected, was appropriately surveyed and 'significant' roosting by bats was ruled out.

In relation to potential roosting features in both structures and trees, a robust and compliant survey effort was carried out by qualified and experienced bat-licensed Ecologists, following relevant best practice guidance. No further surveys are considered warranted.

Access roads and the buffer implementation surrounding Turbine T3 are likely to convert sub-optimal features of plantation canopy into linear edge features suitable for foraging bats. However, the buffer distances for the removal of significant habitat features applied follows best practice guidance and is intended specifically to minimise the potential for collision and barotrauma (NatureScot 2021, NIEA 2026)^{9,10}. In cases of plantation these buffers take a precautionary approach, and a buffer was applied based on the potential future growth of features during the lifetime of the project, irrespective of their current height. The setback distances applied are specifically advised within best practice guidance to minimise the interaction between bats and turbines and are not likely to have the reverse effect of increasing the risk of collision/barotrauma. It is considered that no further information is required to have

¹³ Marell, F., Kelleher, C., Mullen, E. (2022) Bat Mitigation Guidelines for Ireland – V2

certainty on the suitability or effectiveness of this industry-standard measure which was applied following best practice.

The felling and replanting regime displayed in Figure 5.1 of the Bat Survey Report (O'Donnell Environmental, 2026) contained in Appendix 6-2 Bat Report, of the EIAR eliminates the connectivity of features within 50 m of turbine blade tip while planting outside these buffers will create linear habitats for bats away from turbines.

The mitigation outlined in Chapter 6 - Biodiversity of the EIAR includes a bat buffer, cut-in speed/curtailment, and monitoring and is in line with wind farm mitigation guidance published by NatureScot (2021)⁹. The use of bat buffers is considered a suitable mitigation for the impact of collision, barotrauma, and other injuries to bats given that bat activity is related to proximity to habitat features such that activity decreases as distance from habitat features increases (Verboom & Spoelstra 1999; Downs & Racey 2006)^{14, 15}.

Cut-in speed is the minimum wind speed at which a wind turbine will begin to produce power. Curtailment is the reduction or cessation of power output by increasing the cut-in speed, which can be used to protect wildlife including bats.

As stated in Chapter 6 Biodiversity, the effectiveness of these measures will be observed, and the curtailment regime will be adapted if necessary. In the event that bat activity remains consistent or increases and/or carcass searches indicate there are bat fatalities, cut-in speed will be increased. The curtailment effectiveness will be monitored by repeating monitoring in years 1, 3, 5, and 8 or as required by the planning authority.

2.1.11.1 Mitigation Measures

Summary:

The DoHLGH submission states that a schedule collating all mitigation measures should be produced as part of the CEMP and agreed with the Local Authority prior to commencement of any works. This submission further advises that an appropriately qualified Ecologist is retained as an ECoW during any operations and that a post-operation mitigation compliance report is produced by the ECoW and submitted to the Local Authority for review.

Response:

In response it is confirmed that a Schedule of Mitigation Measures is presented in EIAR Chapter 19. This Schedule of Mitigation Measures is also presented in the CEMP (see EIAR Appendix 2-3) along with mitigation measures from the Natura Impact Statement (NIS). These mitigation measures include for the appointment of an ECoW. As noted within the CEMP, this is a live document and will be reviewed and updated, as necessary to incorporate any planning conditions. Upon appointment, the Contractor for construction of the Proposed Project shall

¹⁴ Verboom, B. & Spoelstra, K. (1999) Effects of food abundance and wind on the use of treelines by an insectivorous bat *Pipistrellus pipistrellus*. Canadian Journal of Zoology 77:1393 -1401.

¹⁵ Downs, N.C. & Racey, P.A. (2006) The use by bats of habitat features in mixed farmland in Scotland. Acta Chiropterologica 8:169-185. Hundt, L. (2012) Bat Surveys: Good Practice Guidelines (2nd edition). The Bat Conservation Trust, London. ISBN-13: 9781872745985.



update the CEMP to produce an updated version (i.e. the Contractor's CEMP) which will account for any additional requirements set out in planning conditions.

The DoHLGH submission advises that a condition to any planning grant should be that all mitigation measures outlined in the Natura Impact Statement (NIS) and all other relevant documents must be implemented in full. This is agreeable to the applicant.

2.2 INLAND FISHERIES IRELAND

Summary:

A submission was made in relation to the proposed application along with a number of conditions proposed by IFI. HDD methodologies pose a risk of drilling fluid release, sediment losses and hydrological disturbance if not appropriately designed, monitored and supervised. All mitigation measures identified within the EIAR, NIS, Construction Environmental Management Plan and associated technical documentation shall be implemented in full throughout the construction, operational and decommissioning phases of the development, that all watercourse crossings, drainage crossings and associated instream works shall be designed and constructed in accordance with Inland Fisheries Ireland's Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016), attention shall be paid to the protection of the Little Brosna_040 river and the associated watercourses during all phases of construction. No deterioration in water quality or ecological status shall occur as a consequence of the Proposed Project. Forestry clearance and associated excavation works shall be undertaken in a phased and controlled manner to minimise sediment loss and runoff to receiving waters. Surface water management infrastructure, including settlement ponds, silt traps and drainage controls, shall be installed in advance of major earthworks and maintained for the duration of the construction phase. Monitoring shall be undertaken throughout construction works to ensure mitigation measures remain effective. An appropriately qualified ECoW with fisheries and aquatic ecology experience shall be appointed for the duration of the project works to oversee compliance with all aquatic mitigation measures. IFI shall be consulted at detailed design stage regarding all proposed watercourse crossings, drainage infrastructure and any modifications to existing aquatic features. Concrete washout shall only be undertaken within designated washout areas located at least 50 m from the nearest watercourse. Washout areas shall be located and managed so that there is no discharge to surface waters or watercourse. All waste concrete and washout materials shall be collected and removed off-site for disposal at an appropriately authorised facility. All works should be carried out as per IFIs guidelines.

Response:

The Applicant acknowledges all concerns raised by IFI and the requirements set out in relation to the protection of these mapped and also unmapped watercourses, the macroinvertebrates, riparian vegetation, fish populations, hydrological connectivity and fisheries habitat water quality, ecological status, natural channel morphology. All mitigation measures identified within the EIAR, NIS, Construction Environmental Management Plan (CEMP) and associated technical documentation as well as the above-mentioned mitigations, will be implemented in full throughout the construction, operational and decommissioning phases of the development.

2.3 OFFALY COUNTY COUNCIL

The Applicant notes the Planning Authority's submission concerning the established plan-led approach to wind energy development in County Offaly and acknowledges the substantial contribution which the County has made, and continues to make, towards renewable electricity generation.

2.3.1 Strategic Infrastructure Development (SID)

The project is being determined by An Coimisiún Pleanála as it constitutes a Strategic Infrastructure Development and accordingly falls to be determined directly by the Commission under Irish planning law.

That statutory regime allows for a proposed strategic infrastructure development that may materially contravene an adopted development plan. While the provisions of the relevant development plan are mandatory considerations in the Commission's assessment, they are not determinative and the Commission retains the discretion to grant permission notwithstanding a material contravention.

We would therefore argue that the exercise of that statutory discretion cannot reasonably be characterised as a means of bypassing the plan-led planning system. It is itself an integral part of the statutory planning framework established by the Oireachtas for developments considered to be of strategic importance.

The Applicant is not requesting that the Offaly Wind Energy Strategy be disregarded or treated as having no effect. Rather, the Applicant requests that the Commission perform the exercise contemplated by section 37G: to have full regard to the Development Plan, the proper planning and sustainable development of the area, the environmental effects of the Project, national and regional planning policy, the national interest and all other relevant statutory considerations, and thereafter determine whether the particular circumstances justify the exercise of the section 37G(6) discretion.

2.3.2 Renewable Energy Targets

The submission received from Offaly County Council states that the county has exceeded the 466.3 MW wind-energy target identified in the Offaly County Development Plan (CDP).

We would note that the 466.3 MW figure is the County's stated wind energy target for the end of the Plan period, developed in the context of national renewable-energy policy and, specifically, the Climate Action Plan 2019. We would not however, interpret this as a maximum permissible level of allowed wind energy development and we would not expect this target to become a ceiling cap that would justify the refusal of new renewable energy projects.

We believe this point is important given the evolving nature of Ireland's and the wider EU renewable energy targets. The First Revision of the National Planning Framework (NPF) now establishes specific Regional Renewable Electricity Capacity Allocations. For the Eastern and Midland Region, the NPF identifies 284 MW of energised onshore wind capacity in the 2023 baseline and an additional allocation of 1,966 MW, giving the Region a 25% share of national onshore wind capacity by 2030.

More importantly, the NPF expressly provides that each Region must plan for sufficient wind and solar development to achieve the relevant allocation, taking account of factors affecting delivery including attrition rates and changes in energised capacity, in order to facilitate, at a minimum, achievement of the national 2030 renewable-electricity targets. NPO 74 requires the Regional Assembly to identify allocations for constituent local authorities based on the best available scientific evidence, while NPO 75 requires Local Authorities to plan for delivery of those Target Power Capacity allocations through their development plans.

Accordingly, achievement of a county-level target derived from an earlier national policy context is an important indicator of Offaly's contribution to date, but it does not of itself establish that no further wind-energy development is allowed within the County under the current national and regional policy framework.

Within the same context, the Planning Authority refers to the County's wind-energy "pipeline", which it defines as including operational development, permitted development, projects currently within the planning system and projects at pre-planning stage. The submission states that the pipeline could represent approximately 11% of the national 2030 target and more than 40% of the relevant regional target.

As set out above, the NPF requests that Regional Assemblies should take account of attrition rates and changes in energised capacity when planning for sufficient renewable development. This therefore acknowledges that not all planned projects are taken up and it follows that the pipeline referred to above may not be fully realised.

SEAI records that total installed wind capacity in Ireland at the end of 2025 was approximately 5.1 GW, 15% below the Climate Action Plan milestone of 6 GW for 2025. Government policy continues to identify approximately 9 GW of onshore wind by 2030 as necessary to achieve the targeted renewable-electricity transition. There therefore remains a substantial national delivery requirement over the remaining period to 2030.

The estimated generating capacity of the Ballincor Wind Farm of between 61.6 MW and 77 MW represents a real and quantifiable contribution from a defined project rather than a theoretical contribution represented by early-stage pipeline capacity.

2.3.3 Regional Allocations

With respect to the Planning Authority's comparison between Offaly's percentage of the national wind target and its approximately 2.3% share of the State's landmass, we recognise this as the County's significant and positive contribution to renewable energy generation, but the NPF does not seek to create one blanket target for all counties.

Wind resources, suitable land, environmental capacity, electricity-grid infrastructure and the practical deliverability of projects are distributed unevenly across the State. The NPF itself recognises this by allocating different shares of national onshore wind capacity to the three regions.

2.3.4 Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5.

Summary:

The Applicant acknowledges the location of the project in an area designated under the CDP as “Not Deemed Suitable for Wind Energy Development” on Map No. 10. As before, this issue was expressly identified in the Planning Statement accompanying the planning application and is not disputed.

However, we believe the relevant question is not merely whether the site falls on one side or the other of a relevant map, but whether the detailed evidence submitted with the planning application demonstrates that the project is acceptable.

Response:

The Offaly Wind Energy Strategy describes areas not deemed suitable as being generally unsuitable by reason of matters including environmental, heritage and landscape constraints and housing density. The submitted planning application has investigated those matters at project level. The submitted EIAR, NIS and associated assessments address landscape and visual effects, biodiversity, residential amenity, noise, shadow flicker, hydrology, flood risk, cultural heritage, traffic and other relevant environmental considerations. The layout was developed having regard to those constraints and provides for a minimum residential setback of 720 metres, save for one involved landowner at 550 metres.

This project-specific consideration is reinforced by the Supreme Court judgment in Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5, which cautions against a circular approach, identified as unlawful in Coolglass, allowing a material contravention to become the reason for refusing permission without substantively considering whether the benefits and particular features of the development justify the exercise of the statutory power to grant notwithstanding that contravention. The Supreme Court held that the Commission must engage in a real and substantive manner with that question.

2.3.5 Landscape and Visual Impact Assessment (LVIA)

Summary:

Both Offaly County Council (OCC) and Tipperary County Council (TCC) provided observations which addressed all environmental sections of the EIAR including Landscape and Visual. Comments in relation to Tipperary are addressed below and in Section 2.4.1. Offaly County Council cited various sections from the Landscape and Visual chapter and then made the following comment under the heading ‘PA Comment’;

The Planning Authority considers that the proposed wind turbines will be significant and dominant features in the landscape. The Planning Authority, in particular, having regard to the proximity, orientation and exposure of a significant number of dwellings in the area to the proposed turbines, strongly disagrees with the conclusions contained in Section

12.4.3.3 of the EIAR that the visual effects on ‘Local Community Viewpoints’, apart from some notable negative impacts from the Local Community receptor locations (VP 17, VP 20, VP21, VP22 and VP23), are ‘Not Significant’.

An Coimisiún Pleanála is requested to note the below Photomontages included in the LVIA Photomontages Book 2 which accompany the EIAR, showing the appearance of the proposed turbines from local roads and dwellings in the area

The observation then copies the photomontages from the five specific views identified. Notwithstanding, it is recommended that the original, correct-scale are referred to rather than those copied at a smaller scale into the A4 format observation.

Response:

The LVIA for the proposed development, which was carried out in accordance with relevant guidance and best practice, acknowledged that nearby residential receptors would be negatively impacted. Effects at representative viewpoints in the local context registered up to a Moderate effect in three instances and Substantial-moderate degree in one instance. However, the LVIA notes that such effects are localised and are deemed not significant in EIA terms. Neither the OCC nor TCC observation cites relevant guidance or references which parts of the LVIA approach / methodology it disagrees with to arrive at an alternative conclusion.

A key consideration is that the setback of the proposed turbines complies with the 4 X tip height set back requirement of the Draft Revised Wind Energy Development Guidelines (2019). This setback distance in this instance for the proposed 180 m tip height turbines is 720 m. The prescribed minimum setback distance has been established on the basis of avoiding significant effects on residential amenity, which includes residential visual amenity.

For the reasons outlined above, it is considered that the LVIA related observations from OCC and TCC are not founded on guidance, best practice or national policy for wind energy development. Indeed, neither cites a breach of their own County Development Plan landscape or visual policy.

None of the proposed turbines is contained within the 'High' sensitivity landscape classification area. One turbine is contained in a 'Moderate' sensitivity area, but within an area of cutaway peatland and the remaining turbines (within County Offaly) are all contained in a 'Low' landscape sensitivity zoning. Consequently, the 'Medium-low' landscape sensitivity assessment within the project LVIA is considered to be a reasonable one. Figure 2-2 below is a clearer version of the landscape sensitivity as presented in Figure 12.3 of the EIAR.

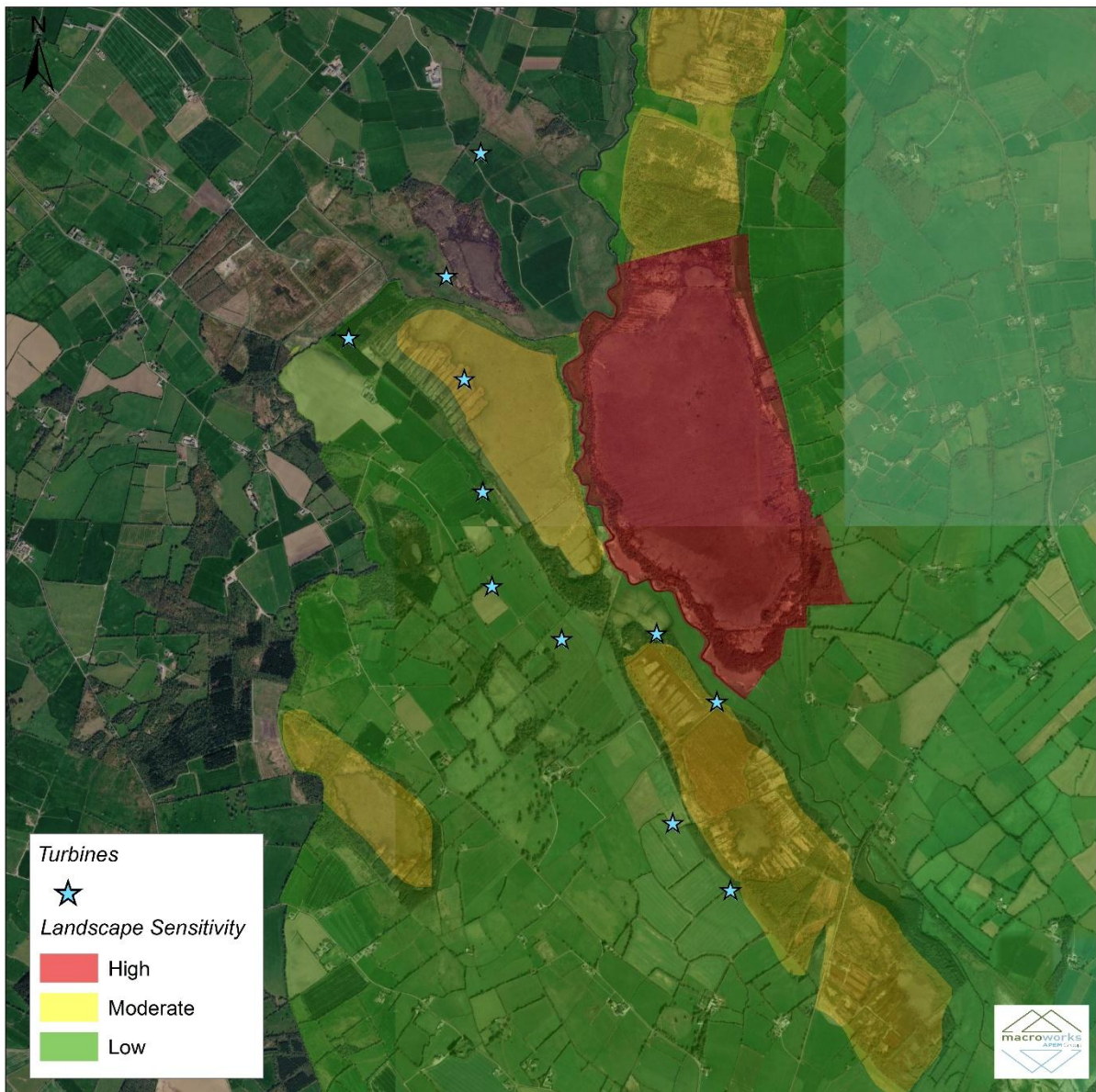


Figure 2-2 Landscape Classification

Notwithstanding, the nuances of mapped boundaries between landscape sensitivity zonings, the landscape should not be read in such a compartmentalised manner and boundaries between landscape classification units are seldom as abrupt on the ground as they appear in CDP maps. This landscape reads as a flat to gently undulating combination of productive agricultural land, cutaway peatland and peatland fringe scrub and commercial forestry. The Offaly CDP has taken the somewhat unique approach of classifying peatland areas and cutaway peatland areas as being of High or Moderate landscape sensitivity and this would not necessarily conform with a more universal approach to classifying landscape sensitivity. Whilst the CDP classifications are an important consideration in the LVIA, they are not definitive and in accordance with relevant Guidance (GLVIA3) the landscape specialist should arrive at their own conclusions regarding landscape sensitivity that are specific to the project scale.

The submitted photomontages have been prepared in accordance with established LVIA visualisation standards, specifically the guidance set out by NatureScot (formerly Scottish Natural Heritage). The methodology, technical parameters, and verification processes are clearly outlined on the second page of each photomontage booklet (Volume IV of the EIAR) and are further described in the relevant sections of the LVIA (see EIAR Chapter 12 (Landscape and Visual Impact)). These visualisations are derived from surveyed viewpoint locations, use calibrated photography, and are prepared in line with recognised best practice guidance and professional judgement to ensure accuracy, reproducibility, and transparency. As such, they provide a reliable and objective representation of the likely visual effects of the proposed wind farm development.

The assessment is based solely on photomontages prepared in accordance with recognised professional guidance and industry standards, ensuring that the visual effects have been assessed on a robust, transparent, and objectively verifiable basis.

2.3.5.1.1 Accuracy of the Photomontages

In terms of the accuracy, Macro Works produce photomontages in line with the current Nature Scot Guidelines and guidance set by the British Landscape Institute 2011 – Advice Note 01/11. Viewpoints were selected and high-quality photography in RAW format is captured using a digital Single-Lens Reflex (SLR) camera with a fixed 50 mm lens on a Monfrotto panoramic head and leveller. Viewpoint locations are then spatially captured using a survey grade Global Positioning System (GPS) unit to within 10 cm of accuracy. High resolution 360-degree panoramas are generated from the captured photography. The scheme is then modelled using a Digital Terrain Model (created with a combination of LiDAR and OS Terrain Data) and real world reference points. It is rendered in Autodesk 3DS Max 2023 with identical image characteristics to that of the camera used for the baseline photography allowing the render and the photography to be merged with a high degree of accuracy.

It should also be noted that the comparison made between the submitted photomontages and Google Street View imagery highlights a potential misunderstanding of photomontage methodology and the strict standards set out in NatureScot's photomontage guidance. Google Street View imagery is captured from a height of approximately 2.5 m above existing ground level, which can result in a greater apparent visibility of the surrounding landscape. In contrast, photomontages are prepared to represent the view of an average observer and are set at a height of 1.7 m above ground level, in accordance with best practice LVIA guidance. Furthermore, Google Street View imagery is typically captured using wide-angle lenses and provides a near-360° panoramic view. These wide-angle lenses can exaggerate the perception of depth and spatial relationships and, therefore, do not provide a true comparison to the visual experience of a receptor from a specific viewpoint. Consequently, comparisons between photomontages and Google Street View imagery are not appropriate or technically valid for LVIA.

2.3.5.1.2 Perceived Selective Nature of the Representative Viewpoints for Assessment

In terms of the selection of the viewpoint locations for assessment, this is guided by the GLVIA3 (Guidelines for Landscape and Visual Impact Assessment). The viewpoint selection is undertaken utilising the ZTV (Zone of Theoretical Visibility) mapping, which provides the basis

for selection of key viewpoints from which to study the visual and landscape impact of the Proposed Project in detail. It is not practical to include every single location that provides a view of the Proposed Project as this would result in an unwieldy report and make it difficult to draw out the key impacts arising. Instead, the assessors endeavoured to select a variety of location types that would provide views of the Proposed Project from different distances, different angles and different contexts. The locations selected are significant because they comprise, for example, centres of population and important communication routes whether due to traffic volume or their scenic value.

An initial broad set of potential views was generated from a desk study using the ZTV map. Each potential VP is colour coded to identify which of the following receptor types it represents;

- Key Views - from features of international or national importance;
- Amenity Views - from important heritage or amenity locations;
- Designated Scenic Routes and Views;
- Local Community Views;
- Centres of Population; and
- and Major Routes.

It is important to note that some VPs may be applicable to several receptor categories, in which case, they will be assessed under the group that best reflects that location's particular sensitivities. Whilst every effort is made to select viewpoints with the clearest and most unimpeded view of the Proposed Project, in some instances, only a partial view of the Proposed Project will be visible from the nearest publicly accessible location that was selected to represent the visual receptor. In instances where the Proposed Project is heavily screened from a specific receptor, a photomontage has been included to highlight the degree of intervening screening afforded between the visual receptor and the proposed turbines. In circumstances where a branch or cluster of vegetation partially screens a turbine or section of the development, the wireframe view is utilised to understand the potential visual impacts and perceived scale of the development from that receptor.

Finally, it is important to note that Macro Works always attempts to use the most open views relative to the receptor being represented, whether these are views from a town or a designated scenic route. It serves no purpose to assess visual impacts from a location, which can be readily proven not to be representative of worst-case visual exposure from a particular receptor, as this only undermines the assessment.

2.3.5.1.3 Summary

In summary, the assessment of visual effects within the submitted LVIA demonstrates that the Proposed Project has been rigorously evaluated using best practice industry-standard methodology and guidance. Photomontages and wireframes have been prepared in accordance with current guidance and best practice and professional judgement, accurately reflecting scale, distance, screening, and the context of the surrounding landscape. Representative viewpoints capture a range of receptor types, distances, and visual conditions, and potential visibility has been comprehensively considered. While the turbines will be noticeable in certain locations, they are appropriately integrated into the landscape, and residual visual effects are deemed Not

Significant. Overall, the assessed residual visual effects are accurate, robust, and reflect a balanced appraisal of the Proposed Projects landscape and visual effects.

2.3.6 Biodiversity

2.3.6.1.1 Marsh Fritillary

Summary:

The Planning Authority highlights the predicted profoundly negative and permanent effect on the local Marsh Fritillary population identified within the Biodiversity Chapter, including the potential loss of the local breeding population and suitable habitat within the Proposed Project site. The Planning Authority also notes the proposed mitigation measures, including pre-construction surveys, avoidance and protection of occupied habitat where possible, translocation of larval webs and Devil's-bit Scabious where avoidance cannot be achieved, management and enhancement of surrounding wet grassland habitat, exclusion zones and long-term post-construction monitoring.

Response:

The concerns of the Planning Authority regarding potential effects on Marsh Fritillary are acknowledged. As identified within Section 6.6.3.3.3 of the submitted Biodiversity Chapter, in the absence of mitigation, the combined effects of direct habitat loss and indirect habitat degradation were conservatively assessed as profoundly negative and permanent. The significance of the potential effect was therefore recognised within the assessment and informed the project of comprehensive mitigation measures.

The proposed mitigation includes pre-construction surveys, avoidance and protection of occupied habitat where practicable, species and habitat translocation where avoidance cannot be achieved, and the management and enhancement of approximately 2.8 ha of suitable wet grassland habitat. Long-term monitoring is also proposed to evaluate the Marsh Fritillary population and the condition and effectiveness of the managed habitat following construction.

The Planning Authority's concerns overlap with those raised by the Department of Housing, Local Government and Heritage regarding the adequacy of the Marsh Fritillary survey data, application of the mitigation, reliance on translocation, timing of works and the management and enhancement of suitable habitat. These matters have been addressed in the response to the Department's submission above and should be read in conjunction with this response.

2.3.6.1.2 Aquatic Ecology Hydrology and Fisheries

Summary:

Having regard to the predicted likely significant effects on aquatic ecology from siltation and contamination, the Planning Authority queries the conclusion from Section 6.6.3.6.4 that “*the potential likely effects during the Construction Phase of the proposed wind farm from water abstraction are appraised as neutral and imperceptible to aquatic ecology*”

The Planning Authority notes the subject site contains peatland habitats, including raised bog and cutover bog that are hydrologically connected to the Little Brosna River, Sharavogue Bog SAC and The Shannon Callows SAC/SPA. The applicant should be requested to demonstrate

that impacts from peat extraction, drainage works and water crossings will not extend beyond the immediate project site.

Response:

A number of design measures and mitigation measures were outlined in the Chapter 9 of the EIAR, SWMP (Appendix 9-4 of the EIAR) and the NIS. Measures include the use of a clear span bridge crossing, silt fencing and hand felling within 10 m of the stream. Effective implementation of the SWMP measures is key and works on the proposed wind farm site will occur under the direction of the ECoW, as set out in Chapter 9 (Hydrology and Hydrogeology) of the submitted EIAR. The methods listed in the EIAR and SWMP are proven mitigation measures and have been carefully chosen to reduce potential effects.

The site will undergo regular audits as set out in Section 2.2 of the CEMP (Appendix 2-3 of the EIAR) and will be monitored as detailed in the SWMP. There will be continuous turbidity monitoring both upgradient and downgradient on these rivers during the pre-construction phase and the construction phase, as outlined in the SWMP (Appendix 9-4 of the EIAR). There will also be extensive surface water monitoring during pre-construction, construction and post-construction, including visual inspection, water sampling and site walkovers. These measures, along with further mitigation measures outlined in Chapter 2, Chapter 9 and CEMP (Appendix 2-3 of the EIAR), will be implemented to ensure that the proposed wind farm will not compromise progress towards achieving Good Ecological Status or cause a deterioration of the overall status of these surface waterbodies during the construction or operational phases.

The settlement ponds will remain in place during the operational phase and create some wetland areas along with the flood compensation area providing a wet grassland/pond area. The flood compensation area will be approximately 1.3 ha in area. An area adjacent to the substation will be designated for flood compensation measures. This will have a dual function for biodiversity as it will also act as an ephemeral pond. The base will not be lined, which will result in the water level rising and falling depending on weather conditions. The advantage of ephemeral ponds is that frog spawn will have a chance to mature.

Areas that are rewetting are likely to transition to wetlands/mires, overall, 'Ireland could have an area of potential natural mires greater than in any other European country at these latitude' (Wilson, 2011).

The settlement ponds and flood attenuation area slow down floodwaters, causing sediment and the nutrients attached to it (like phosphorus and nitrogen) to settle out. Research on the Rhine River floodplains indicates that restoring ponds and reedbeds is particularly beneficial for phosphorus retention, making them more effective than woodlands or grasslands for this purpose. As detailed in Chapter 6, Section 6.8.4 of the EIAR, no likely significant effects to aquatic ecology are anticipated.

2.3.6.1.3 Bats

Summary:

Offaly County Council notes there is a particular need to protect and strengthen bat populations including roosting, commuting and foraging habitat and disruption of these features is contrary to the requirements of the Habitats Directive. Offaly County Council also queries the conclusion

of slight negative effects on high collision risk species. The Council states that no quantitative analysis of bat mortality was carried out. The County Council also states that turbine curtailment is deferred to a later decision based on future monitoring describing this as a reversal of the Precautionary Principle.

Response:

As detailed in Marnell et al. (2022) commuting and foraging routes are not legally protected but must be taken into account when assessing impacts. The potential impacts on bat roosting, foraging, and commuting are addressed in Section 4.1.1 of the Bat Survey Report – Appendix 6-2 of the EIAR (O'Donnell Environmental, 2026). Robust and compliant surveys were carried out which meet or exceed the standards required by NIEA (2026), Marnell et al. (2022), and NatureScot (2021) (see Section 2 of Bat Survey Report (O'Donnell Environmental, 2026)) to inform this assessment. This included assessments of roosting habitats and any potential for disturbance.

As detailed in the response to Third-party Submissions in Section 3.25.5 below vegetation removal within 'bat buffers' is prescribed to reduce the levels of bat activity proximal to turbines and is an effective method of reducing interaction of bats and turbine blades. The replanting detailed in Section 5 of the Bat Survey Report address the potential for effects on habitat connectivity for bats and contains measures to increase connectivity overall within and through the site, while maintaining a buffer distance from turbines.

The conclusion of 'slight negative effect' on high collision risk species is based on a site wide assessment. Slight as defined in EPA (2022) is "*An effect which causes noticeable changes in the character of the environment without affecting its sensitivities*". For Pipistrelle species in the spring and summer seasons as many locations recorded activity that was 'moderate – low' as 'moderate' or 'high'. For Leisler's Bat predominantly 'low – moderate' activity was recorded in all locations and seasons with occasional 'moderate' activity being an exception. The site measured as a whole, in terms of its bat species composition, roosting population, and activity levels is not remarkable beyond a local level, but there is potential for a measurable effect on bat populations locally in the absence of mitigation. This is consistent with the definition of 'slight negative' following EPA (2022).

There are no mechanisms to quantitatively assess bat mortality as exist currently for bird fatality rates (i.e. quantifiable collision risk modelling). In the absence of such models, the best available methodology is detailed in NatureScot (2021). This methodology provides a robust, structured framework that is widely adopted in the UK and Ireland.

This is a site-level risk-based approach using activity as a proxy for possible operational stage fatality risk, the efficacy of which will be confirmed with post-construction monitoring. NatureScot (2021) acknowledges that the use of activity pre-construction as a proxy for operational phase collision risk and therefore mortality, is not always reliable.

In line with NIEA (2026) the mitigation detailed in the Section 5 of the Bat Survey Report allows for the opportunity to implement additional measures should the post-construction monitoring find that mortality reaches a significant level (more than one bat per turbine per year).

2.3.6.1.4 Hydrological Connectivity and Effects on Sharavogue Bog SAC and Other Designated Sites.

Summary:

Concerns were raised regarding the potential for hydrological effects associated with the Proposed Project to extend beyond the development site and affect nearby designated sites. In particular, the Planning Authority notes the presence of raised and cutover bog habitats and their hydrological relationship with the Little Brosna River, Sharavogue Bog SAC and the Shannon Callows SAC/SPA, and seeks further demonstration that peat excavation, drainage works and watercourse crossings will not result in off-site effects. Concerns were also raised regarding the close proximity of the Proposed Project to Sharavogue Bog SAC and the potential for the development to interfere with ongoing State-funded hydrological restoration of the raised bog.

Response:

The concerns regarding hydrological connectivity and potential effects on nearby designated sites are acknowledged. Potential effects arising from peat excavation, drainage, watercourse crossings and other construction activities were considered within the Hydrology and Hydrogeology Chapter of the EIAR and, where relevant to European sites, within the NIS. The assessment considered potential surface water and groundwater pathways, together with measures to manage drainage, runoff and water quality during construction.

With specific regard to Sharavogue Bog SAC, the proximity of the Proposed Project is acknowledged; however, proximity alone does not establish a hydrological pathway to the qualifying habitats. The potential for groundwater connectivity with Sharavogue Bog SAC, and indirect hydrological effects on Annex I raised bog habitat, have been considered in greater detail in response to the Department's observations in Section 2.1 above and should be read in conjunction with this response.

On the basis of the hydrological and hydrogeological assessments undertaken, no pathway was identified through which the Proposed Project would significantly alter the hydrological regime or conservation objectives of Sharavogue Bog SAC.

2.3.6.1.5 Hedgerows, Trees and Woodland

Summary:

The Planning Authority recommends the retention and protection of existing hedgerows, woodland and trees within and adjacent to the Proposed Project in accordance with the Offaly County Development Plan 2021–2027. Where removal is required, the Planning Authority notes the requirement to obtain any necessary Tree Felling Licence in accordance with the Forestry Act 2014.

Response:

The Planning Authority's recommendations regarding the retention and protection of existing hedgerows, woodland and trees are acknowledged. Vegetation removal will be limited to that required to facilitate the Proposed Project, with retained vegetation protected in accordance with the measures outlined within the EIAR.

Where tree or woodland removal requires consent under the Forestry Act 2014, the appropriate Tree Felling Licence will be obtained from the Department of Agriculture, Food and the Marine prior to undertaking such works.

2.3.6.1.6 Hen Harrier Survey Effort and Potential Roosting Use

Summary:

The Planning Authority notes that no Hen Harrier surveys were undertaken during the 2022 breeding season and that winter roost surveys were only undertaken during the 2025/2026 survey season. On this basis, the Planning Authority considers that the potential use of the Proposed Project site by roosting Hen Harriers cannot be fully excluded.

Response:

The absence of targeted Hen Harrier surveys during the 2022 breeding season and the more limited temporal extent of winter roost surveys are acknowledged and were considered during the preparation of Chapter 7 Ornithology.

As outlined in the Chapter 7 Ornithology, Hen Harrier was identified as a species requiring further consideration owing to its conservation status and the suitability of habitats present within the study area. The Chapter 7 Ornithology assessment therefore considered field survey data in conjunction with habitat appraisal and desk-study information to evaluate the potential for the Proposed Project site to support the species.

Targeted winter roost surveys undertaken during 2025/2026 did not identify a Hen Harrier roost within the Proposed Project site. While these surveys represent a single winter season and therefore cannot account for potential annual variation in roosting activity, the assessment was not based solely on the results of the winter roost surveys, the characteristics of the available habitats within the Proposed Project site were also considered. No additional information to demonstrate regular roosting activity within the Proposed Project site was identified. Consequently, while the limitations associated with the survey programme are recognised, the conclusions presented within the submitted Ornithology Chapter remain unchanged.

2.3.6.1.7 Functional Importance of the Site for SPA-associated Waders

Summary

The Planning Authority has raised concerns in relation to the NIS not providing a sufficiently robust evaluation of the functional importance of habitats within the Proposed wind farm in supporting SPAs-associated wading bird species, particularly Golden Plover and Lapwing.

Response

The potential importance of habitats within the Proposed Project site for SPA-associated wading bird species, including Golden Plover and Lapwing, was considered within the submitted Ornithology Chapter and NIS.

Both assessments considered the availability and suitability of habitats within the Proposed Project site and the surrounding landscape, together with the available survey data and desk-study information. Both assessments also considered the potential for ecological connectivity between the Proposed Project site and nearby designated sites supporting these species.

Concerns relating to the adequacy of the survey programme. While certain limitations associated with the survey programme are acknowledged, the assessment incorporated multiple survey seasons undertaken over an extended period and was supplemented by habitat appraisal, consultation and desk-study information.

The assessment of Golden Plover, Lapwing and other SPA-associated species was undertaken in the context of their ecological requirements, their use of habitats within the wider landscape and the potential pathways through which effects could arise. These informed both the ornithological assessment and the NIS.

On this basis, it is considered that the functional importance of habitats within the Proposed Project site was appropriately considered within the submitted documentation, and the conclusions of the submitted Ornithology Chapter and NIS remain unchanged. Chapter 7 of the EIAR has assessed the potential environmental effects on ornithological receptors from the construction, operation and maintenance and decommissioning phases of the Proposed Project. Where significant effects have been identified, mitigation has been considered and incorporated into the assessment.

2.3.6.1.8 Barrier, Disturbance, Displacement and Habitat Effects

Summary

The Planning Authority expressed concerns regarding the potential for the proposed turbine array to alter established bird flight paths and create barrier effects for migratory species. Additionally, they raised concerns relating to the potential for disturbance and displacement resulting in the abandonment of roosting, nesting and foraging habitats, as well as the potential loss or degradation of functionally important habitats such as winter roost sites and potential breeding areas.

Response

The potential for barrier effects, disturbance, displacement and habitat-related impacts was considered within the submitted Ornithology Chapter and NIS.

Both assessments considered the potential for the proposed turbine array to influence bird movements within the wider landscape, including movements associated with nearby wetlands, river corridors and designated sites. Particular consideration was given to species identified as KORs (see Section 7.6.3, Chapter 7 of the EIAR) and SCI species, which included relevant wintering and migratory waterbirds.

The potential for disturbance and displacement was assessed with reference to the sensitivity of individual species, including their use of nesting, roosting and foraging habitats within the Proposed Project site and the surrounding landscape. Similarly, the assessments considered the potential for the loss or degradation of habitats that may support protected bird species.

As discussed in Appendix 1 within this response document, the River Little Brosna and associated callows were recognised within the ornithological assessment as important movement corridors for a range of wetland bird species. Similarly, the importance of habitats supporting species such as Golden Plover, Lapwing, Whooper Swan and Hen Harrier was specifically considered within the assessment.

On this basis, the conclusions of the submitted Ornithology Chapter and NIS remain unchanged.

2.3.6.1.9 Collision Risk Assessment Methodology

Summary

The Planning Authority advised that the Applicant should demonstrate full compliance with best practice in relation to bird strike risk. In particular, concerns were raised regarding the robustness of the collision risk assessment methodology, the assessment of cumulative and in-combination effects, and the potential for increasing development pressure within the wider landscape to influence migratory bird movements.

Response

Collision risk was assessed within the submitted Ornithology Chapter and NIS using methodologies consistent with recognised guidance and current best practice as detailed in Appendix 7-2 CRM. Further detailed clarifications are provided in **Appendix 1** of this submission response.

The collision risk model (CRM) Report, presented in Appendix 7-2 of the Ornithology Chapter, provides a detailed description of the methodologies, assumptions and parameters used within the assessment. The report also outlines the rationale for the inclusion and exclusion of individual species within the collision risk assessment and describes the approach adopted in relation to species selection, flight activity data and model inputs.

The Ornithology Chapter also examined the potential for cumulative effects arising from interactions with other existing, consented and proposed wind farms within the wider study area. The cumulative assessment was undertaken in accordance with the relevant guidance and considered the potential for cumulative collision risk, disturbance, displacement and barrier effects. No likely significant cumulative effects were identified.

As acknowledged previously within this response document, certain limitations associated with the underlying survey dataset were identified during the assessment process. To address these limitations, a precautionary approach was applied throughout the collision risk modelling process, including the application of conservative assumptions. These assumptions acted to increase, rather than reduce, the predicted level of collision risk associated with the Proposed Project.

The assessment also considered the wider landscape context, including the presence of important wetland habitats, designated sites and recognised bird movement corridors. These considerations informed both the species selected for CRM assessment and the cumulative assessment.

On this basis, it is considered that a robust CRM assessment was undertaken in accordance with relevant guidance and best practice methods, and that the conclusions presented within the submitted Ornithology Chapter remain unchanged.

2.3.6.1.10 Flight Activity, Brosna North Corridor and Viewshed Coverage

Summary:

The Planning Authority raised concerns around the CRM not accounting for bird activity within the “Brosna North area”, despite this area reportedly having substantially higher flight densities than the modelled zone. The Planning Authority also noted that T5 was outside the viewshed analysis during all seasons, raising concerns on whether sufficient survey coverage was available to adequately assess collision risk at this turbine.

Response:

With regard to a submission that T5 was outside the area covered by the viewshed analysis, this is incorrect, the turbine location was in fact located within the viewshed, albeit positioned towards the periphery of the relevant Ecology Ireland and TOBIN viewsheds – See Appendix 7-2. Visibility at this location was more constrained at lower flight heights, with the visible airspace extending from approximately 30 m above ground level, compared with the lowest rotor sweep of approximately 17 m. T5 is located away from the River Brosna where activity is lower. This limitation was recognised and taken into account when interpreting the available flight activity data and assessing potential collision risk at this turbine location.

2.3.6.1.11 Cumulative and In-combination Collision Risk

Summary:

The Planning Authority noted that four wind farm developments occur within the same bird zone of influence and have assessed each other as part of the baseline, rather than combining their predicted effects cumulatively. They concluded that this approach results in no overall cumulative mortality figure being presented and may therefore underestimate the combined collision risk.

Response:

The Planning Authority's concerns regarding the assessment of cumulative effects are noted, however the potential for cumulative effects arising from the Proposed Project in combination with other existing, consented and proposed wind energy developments was considered within the submitted Ornithology Chapter.

As outlined in the response, the cumulative assessment considered the potential for combined collision risk, disturbance, displacement and barrier effects associated with developments within the relevant study area. The assessment did not consider the Proposed Project in isolation but considered the potential for interactions with other developments and the relevant species.

For collision risk, the assessment considered the available information and predicted mortality associated with the relevant nearby developments and assessed this in the context of the species populations and conservation status. The approach therefore does not assume that cumulative effects are absent simply because an individual development does not give rise to a significant effect in isolation.

2.3.6.1.12 Barn Owl

Summary:

Similar to observations from third-party submissions, the Planning Authority noted that the south Offaly area has a high density of Barn Owl, with some confirmed nests as close as 160 m from the nearest proposed turbines. It was also noted that no dedicated Barn Owl survey was conducted over the survey period.

Response:

The Planning Authority's comments regarding the occurrence of Barn Owl within the wider area, including the reported nest site located approximately 160 m from a proposed turbine, are acknowledged.

The species was not directly recorded during targeted ornithological surveys within the study area. However, evidence of Barn Owl presence in the wider landscape was identified through incidental records while conducting other ecological surveys in the area (notably multidisciplinary and habitat surveys).

The predominantly nocturnal behaviour of Barn Owl was recognised as a limitation of the conventional daytime survey programme. No dedicated nocturnal Barn Owl surveys were undertaken, and this was considered as a limitation within the assessment rather than treating the lack of nocturnal observations as evidence of absence. The ornithological assessment instead considered available field observations alongside habitat appraisal, desk study information, consultation undertaken with BirdWatch Ireland, and published information on Barn Owl ecology.

The presence of breeding Barn Owl in the south Offaly area, including in close proximity to the proposed turbines, indicates that the species may use the wider area for foraging. However, proximity to a breeding location does not in itself demonstrate regular use of the proposed turbine locations or establish a significant collision risk. As per Ruddock & Whitfield (2007)¹⁶, barn owl have a limit of disturbance at 50-100 m, with many nest sites not being disturbed until a human was within 10 m during the study. Collision related mortality is not likely to significantly impact this species, particularly given this species flies at low elevation (3-4 m) when foraging (Barn Owl Trust)¹⁷.

As outlined in section 7.6.3 of the EIAR, the proposed internal infrastructure will result in the loss of a relatively small proportion of habitat (c. 28.83 ha), equating to approximately 6% of the total Proposed Project site area. Of this, only a proportion comprises suitable open agricultural habitat that may be used for foraging (equating to approximately 4% of the total site area). Additionally, there will be no loss of known or suitable breeding habitat for this species, and there is a high availability of comparable suitable open agricultural habitat suitable for foraging within the wider surrounding area. It is considered that the potential effects on Barn Owl have been appropriately assessed and the conclusions of the submitted Ornithology Chapter remain unchanged.

2.3.6.1.13 Operational Monitoring and Adaptive Management

Summary:

¹⁶ Ruddock, M., Whitfield, D. A review of disturbance distances in selected bird species

¹⁷ <https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-wind-turbines/>



The Planning Authority advised that a comprehensive, enforceable and adequately resourced long-term monitoring and adaptive management programme should be implemented throughout the operational lifetime of the Proposed Project. The Planning Authority further recommends that the programme should include clearly defined thresholds and mechanisms for corrective action should unforeseen impacts on bird populations be identified.

Response:

The requirement for post-construction monitoring and adaptive management is acknowledged. The proposed approach to monitoring and mitigation is outlined within the submitted Ornithology Chapter (section 7.8 and appendix 7-3). Where appropriate, monitoring measures have been incorporated to assess the effectiveness of the mitigation measures identified during the assessment process.

The programme has been carefully developed to ensure that the Proposed Project can proceed while safeguarding local and migratory bird populations. It has been designed to understand, mitigate, and monitor potential effects on birds, as well as outlining a detailed plan for both the construction and operation phases of the Proposed Project at the wind farm site. The overarching objective of the programme is to understand bird behaviour, identify potential risks, and ensure appropriate protections are in place, with clear objectives and targeted monitoring actions tailored to each phase.

2.3.6.1.14 Nature Restoration and Wider Landscape Considerations

Summary:

The Planning Authority considered that, in light of the EU Nature Restoration Law, developments that do not directly contribute to habitat restoration should be subject to a high level of scrutiny. It considers that a precautionary approach is required to ensure that the integrity, connectivity and recovery potential of the wider bog and wetland landscape are not adversely affected.

Response:

The Planning Authority's comments regarding the need for a precautionary approach in the context of the EU Nature Restoration Law are noted. A precautionary approach has been applied throughout the ecological assessment, including consideration of the potential effects of the Proposed Project on the wider bog and wetland landscape and associated habitats and species.

In addition to the mitigation measures proposed to avoid and reduce potential effects, a Biodiversity Enhancement Plan (Appendix 6-1 of the EIAR) has been prepared and will be implemented as part of the Proposed Project. The Biodiversity Enhancement Plan includes measures intended to improve the ecological value of habitats within the Proposed Project site and contribute to the longer-term enhancement of the wider environment.

2.3.7 Hydrology and Hydrogeology

Summary:

While the applicant concludes that flood risks, hydrological and hydrogeological impacts can be mitigated to acceptable levels, Offaly County Council remains concerned about:

1. Floodplain development and flood risk management.
2. Hydrological impacts on peatlands and nearby European sites/ Adequacy of groundwater and peatland assessments.

Response:

The submission relates to flooding and in particular Turbines T1, T2, T8 and T9 hardstands which are partially located in Flood Zone A/B. T9's hardstand is 50% inundated in a 1-in-100 year event. This is acknowledged in the Flood Risk Assessment. It is stated that the same flood events that inundate these structures will overwhelm the sediment and pollution control measures upon which the entire WFD compliance case rests. Similarly, the NIS conclusion of no adverse effect on the integrity of downstream European sites (Shannon Callows SAC, Little Brosna Callows SPA, Dovegrove Callows SPA, Middle Shannon Callows SPA, Lough Derg SPA) rests entirely on mitigation measures that cannot function during the flood events already shown to affect the site.

The Applicant acknowledges that the recorded flood event in 2025 resulted in flooding across parts of the site and that the modelled flood extents indicate inundation of certain sections of the proposed access track network. Flood levels in November 2025 were at the highest levels recorded at Croghan Bridge gauging station.

The proposed access roads will be constructed above the existing ground level. As a result, although the current flood mapping shows inundation across the existing terrain, the completed road surfaces are not expected to be inundated during the equivalent design flood events assessed.

The introduction of raised access tracks will result in a localised loss of floodplain storage. This loss has been more than compensated for through the provision of dedicated flood compensation storage areas within the site design. The proposed compensation storage volume exceeds the volume displaced by the raised infrastructure, ensuring that there is no net loss of floodplain storage and no adverse impact on flood risk elsewhere.

As stated in the FRA, over 14,000 m³ of additional flood compensation will be created by the proposed wind farm which will mitigate any loss on the proposed wind farm site. The route of the road follows an route along the flood plain which has been elevated due to placement of historical drainage. The river is still connected to its floodplain with additional flood capacity to be provided.

In addition, the section of access track identified as the T9 Southwards Road is required on a temporary basis **only to facilitate construction activities**. Upon completion of its intended use, this temporary road will be removed and the area will be reinstated to its original ground levels as stated in Chapter 2 - Project Description. Consequently, this section of track will not result in any permanent loss of floodplain storage.

Based on the above, while the existing flood extents indicate flooding of portions of the current ground surface, the proposed permanent access roads are expected to remain above flood

levels, and appropriate flood compensation measures have been incorporated to ensure that the development does not increase flood risk or reduce overall floodplain storage capacity.

2.3.7.1 Water Quality

Summary:

Concern was raised in relation to hydrological impacts on peatlands and the receiving surface waters

Response:

In relation to surface water protection, the EIAR identifies the principal risks as the generation of sediment-laden runoff, dewatering discharges, and accidental release of fuels, oils, concrete or other contaminants during construction. Sections 9.5 and 9.8 state that these risks will be managed through a comprehensive package of measures including adherence to CIRIA C741 Environmental Good Practice on Site, implementation of the Appendix 2-3 CEMP, dedicated sediment and erosion controls, daily inspection of dewatering activities, and ongoing maintenance of silt control infrastructure. The EIAR concludes that, with these controls in place, there will be no significant negative effect on the hydrological environment.

The proposed turbines are hydrologically connected to the surface water regime however with the implementation of mitigation measures the risk is reduced. The settlement ponds are likely to create some wetland areas with the flood compensation area providing a wet grassland/pond area. The flood compensation area will be approximately 1.3 ha in area. An area adjacent to the substation will be designated for flood compensation measures. This will have a dual function for biodiversity as it will also act as an ephemeral pond. The base will not be lined, which will result in the water level rising and falling depending on weather conditions. The advantage of ephemeral ponds is that frog spawn will have a chance to mature as large diving beetles (*Dytiscus marginalis*) will die out when the pond dries out. The large diving beetle is described as a 'voracious predator' which preys on smaller invertebrates, tadpoles and small fish.

Settlement ponds slow down floodwaters, causing sediment and the nutrients attached to it (like phosphorus and nitrogen) to settle out. Research on the Rhine River floodplains indicates that restoring ponds and reedbeds is particularly beneficial for phosphorus retention, making them more effective than woodlands or grasslands for this purpose

In relation to protected habitats, this is addressed in Section 2.3.6 above and EIAR Chapter 6 Biodiversity.

2.3.8 Shadow Flicker

Summary:

Concern was raised regarding shadow flicker related to the general potential impacts there may be on households.

Response:

The applicant is committed to near-zero" shadow flicker effects from the Proposed Project on the local community and is committing to ensuring a near-zero shadow flicker at the shadow

flicker receptors identified within 1.63 km (ten rotor diameters) of the proposed wind turbine locations. As described in Section 16.5 of the submitted EIAR, these measures include turbine shutdown and screening, the latter of which will only be considered if the property is either naturally screened (by topography, buildings, vegetation, etc.) or where the homeowner is happy to accept such measures. These proposed mitigation measures are proven and widely used in the wind energy industry.

The Applicant's approach — combining industry-standard modelling, pre-construction verification, real-time sensor-controlled shutdown, and transparent 'near-zero' commitment — represents best practice in Ireland and internationally. The following addresses each submission received, demonstrating that the Proposed Project exceeds regulatory requirements and protects all sensitive receptors.

2.3.9 Archaeology

Summary:

The planning authorities internal Conservation Report details that the Proposed Project would have an unacceptable impact on the architectural, archaeological and cultural heritage of the area, and would be unduly invasive in this sensitive context. It notes that the chapter:

- Clearly identifies moderate adverse impacts on multiple heritage assets;
- Acknowledges high archaeological potential,
- Confirms that visual impacts cannot be mitigated

Response:

The Applicant respectfully disagrees with the conclusion that the Proposed Project would result in an unacceptable impact on the architectural, archaeological and cultural heritage resource of the area or that it would be unduly invasive within its receiving environment.

While Chapter 13 of the EIAR identifies a number of heritage receptors that may experience effects arising from the Proposed Project, the presence of impacts does not, in itself, equate to unacceptable effects or justify refusal of permission. The assessment was undertaken in accordance with recognised professional guidance and applied a transparent methodology that considered receptor sensitivity, magnitude of change, duration and significance of effects.

The finding of moderate adverse effects on certain heritage assets reflects the visibility of elements of the Proposed Project within a wider landscape context. Such effects are not uncommon for strategic renewable energy infrastructure and do not necessarily indicate a significant impairment of the heritage value, setting, integrity or appreciation of the assets concerned.

The assessment demonstrates that the protected structures, archaeological monuments and cultural heritage features within the study area would remain intact, accessible and capable of being understood and appreciated in their historical and cultural context. No direct physical impacts on recorded architectural heritage assets have been identified. Consequently, the fundamental heritage significance of these assets would remain preserved.

The EIAR proposes a comprehensive programme of archaeological mitigation including:

- Pre-construction archaeological assessment and investigations where required;
- Archaeological test excavation of identified areas of potential;
- Archaeological monitoring of ground disturbance works;
- Preservation in situ where feasible;
- Preservation by record where necessary and agreed with the National Monuments Service.

These measures are standard, proven and effective mechanisms for ensuring that any previously unidentified archaeological resource is appropriately managed and protected. As such, the existence of archaeological potential does not give rise to a conclusion of unacceptable impact.

The Applicant respectfully disagrees with the suggestion that the proposed Ballincor Wind Farm would adversely affect the operation, scientific value, or setting of the telescope/observatory. A review of the site topography, vegetation cover, and the project layout demonstrates that the proposed turbines are not visible from the telescope location. The Proposed Project is separated from the observatory by intervening landforms, existing vegetation, woodland blocks and local topography which prevent direct views of the turbines.

The Applicant notes the comments relating to archaeology, architectural heritage and cultural heritage, including the Birr Castle Demesne Great Telescope (The Leviathan). A comprehensive Archaeology, Architectural and Cultural Heritage Assessment was undertaken as part of the EIAR. The assessment considered all archaeological, architectural and cultural heritage receptors within defined study areas extending up to 10 km from the proposed turbines and specifically included the Birr Castle Demesne Great Telescope, which is located approximately 5.27 km northeast of Turbine 1 and forms part of the UNESCO Tentative List nomination for the Historic Astronomical Observatories of Ireland.

There is no visibility between the telescope and the proposed turbines, the development cannot give rise to visual intrusion within views experienced from the telescope itself. In all cases, the turbine are not visible from the I-LOFAR and telescope. The maximum angle of elevation of the 180 m blade tip is between 1.18 to 2.04 degrees above the I-LOFAR/telescope site. The existing Lacka wind farm is approximately 1.2 degrees above the I-LOFAR/telescope site. The EIAR and accompanying LVIA demonstrate that visibility of the proposed turbines is highly constrained by the flat topography of the area, extensive forestry, hedgerows and intervening vegetation. The assessment concludes that the proposed wind farm will not result in any direct effects on recorded archaeological monuments, protected structures, the Birr Castle Demesne, the Great Telescope, National Monuments or sites subject to Preservation Orders. The Great Telescope derives its significance from its internationally important contribution to the development of astronomy and from its preserved historic context within Birr Castle Demesne. The Proposed Project is located outside the demesne and does not physically affect any element of the observatory complex, associated research infrastructure, protected structures, or related cultural heritage assets.

The telescope is located within the enclosed setting of Birr Castle Demesne and the assessment of heritage setting and visual effects undertaken as part of Chapter 13 found that no significant

operational impacts are predicted for any site of national or international significance, including the telescope. The EIAR specifically states that no significant operational impacts are predicted in relation to sites of national or international significance and identifies no significant negative effects on the UNESCO Tentative List receptor.

The suggestion that the EIAR's conclusions are not supported by its findings is not accepted. The identification of moderate adverse effects, the recognition of archaeological potential, and the acknowledgement of residual visual effects are entirely consistent with the overall conclusion reached in the assessment. The EIAR does not conclude that there will be no impacts; rather, it concludes that, following embedded mitigation and proposed mitigation measures, no effects of such magnitude arise as to warrant a finding of significant adverse impact on the architectural, archaeological or cultural heritage resource as a whole.

The assessment follows a balanced and evidence-based approach, distinguishing between the existence of effects and the significance of those effects. The conclusion reflects the professional judgement of qualified specialists and is consistent with recognised assessment protocol.

2.3.10 *Traffic and Transportation*

Observations received from statutory bodies, raised a number of matters relating to traffic and transportation during the construction phase of the Proposed Project. The matters raised principally relate to the proposed site access arrangements; the suitability and condition of the existing road network; construction traffic volumes; road safety; potential effects on schools, vulnerable road users, agricultural activities and emergency services; grid connection works and road closures; abnormal-load deliveries; road reinstatement; consultation and advance notification; and cumulative traffic effects.

The Traffic and Transportation chapter of the EIAR (Chapter 14) and the responses provided herein have been prepared by TOBIN. To avoid repetition, related matters raised across the submissions have been grouped under a number of key themes and are addressed in the following sections.

The responses refer, where relevant, to the Traffic and Transport Assessment presented in EIAR Chapter 14 and the Traffic Management Plan (TMP) included in Appendix 2-2, both of which were submitted as part of the planning application.

2.3.10.1 *SITE ACCESS ARRANGEMENTS AND VISIBILITY*

Summary:

Submissions raised concerns regarding the location and safety of the proposed R492 site entrance, particularly in relation to available visibility, its proximity to a bend and nearby bridges, and the safe movement of construction vehicles. Submissions also questioned the different visibility distances referenced in the EIAR, TMP and Road Safety Audit and contended that the available visibility may be insufficient having regard to the traffic speeds recorded on the adjoining roads.

Response:

The proposed site entrances have been designed in accordance with the requirements of the *Offaly County Development Plan 2021–2027 and Tipperary County Development Plan 2022–2028*, together with *TII Publication DN-GEO-03060, Geometric Design of Junctions*, and *TII Publication DN-GEO-03031, Rural Road Link Design*.

The access assessment considered operating speeds of up to 100 km/h, having regard to the speeds recorded during the Automatic Traffic Count surveys at the proposed access locations. On this basis, horizontal visibility splays comprising a 3.0 m x-distance and a 215 m y-distance were assessed. The submitted visibility splays are presented on Drawings 11333-2050 and 11333-2051 and demonstrate that the required horizontal visibility is achievable at both proposed entrances.

The shorter visibility distances referenced in the supporting documentation relate to the visibility requirements derived from the posted speed limits on the R492 and L1071 and do not represent the maximum horizontal visibility available at the proposed entrances. The use of a 215 m horizontal visibility distance therefore represents a conservative assessment that also takes account of the operating speeds recorded during the surveys.

Drawing 11333-2050 demonstrates that horizontal visibility splays of 3.0 m × 215 m are achievable in both directions at the proposed R492 entrance. The drawing also presents the vertical visibility assessment along the R492, which demonstrates that vertical visibility of 165 m is available on the more constrained approach. While the available 165 m exceeds the 160 m visibility distance corresponding to the existing 80 km/h posted speed limit, it is less than the 215 m distance adopted for the assessment of operating speeds approaching 100 km/h.

Accordingly, the Applicant will request that Offaly County Council introduce a temporary 60 km/h speed limit on the affected section of the R492 for the duration of the construction phase. The available 165 m vertical visibility exceeds the 150 m sight-distance requirement for regional roads under Development Management Standard DMS-97 of the Offaly County Development Plan and the 120 m visibility distance associated with a 60 km/h speed limit. The extent and duration of the temporary speed limit and the associated signage will be agreed with Offaly County Council and implemented in accordance with the applicable statutory procedures and Chapter 8 of the Traffic Signs Manual before the principal construction entrance becomes operational.

Drawing 11333-2051 similarly demonstrates that horizontal visibility splays of 3.0 m × 215 m are achievable in both directions at the proposed L1071 entrance, exceeding the 120 m requirement associated with its 60 km/h posted speed limit. Accordingly, the different visibility distances referenced in the supporting documents reflect the applicable posted and assessed operating speeds and the distinction between horizontal and vertical visibility at the proposed entrances.

The proximity of the proposed R492 entrance to the bend and nearby bridges was considered in the assessment of the available sightlines. The submitted drawings demonstrate that a 215 m horizontal visibility splay can be achieved along the R492, including on the approach from the nearby bridge. Accordingly, the presence of the bend and bridges does not prevent the required horizontal visibility from being provided at the proposed entrance. Vegetation within the

visibility splays will be trimmed and maintained where necessary to ensure that the required visibility remains available.

Swept path analysis was undertaken for the anticipated construction vehicles and demonstrates that the proposed accesses provide sufficient space for these vehicles to enter and leave the site. The entrance gates will be set back to allow a large vehicle to wait clear of the public road while the gates are being opened, thereby avoiding obstruction of passing traffic.

The R492 entrance will serve as the principal construction access, while the L1071 entrance will operate as a secondary access for localised works, maintenance activities and operational traffic. During peak construction activities, Traffic Management Operatives may be deployed at the R492 entrance to manage construction vehicles entering and leaving the site and their interaction with existing road users.

In accordance with the Traffic Management Plan (TMP), appropriate advance warning and construction traffic signage will be provided on the approaches to the site entrances to advise drivers of construction activity and the presence of construction vehicles entering and leaving the site. Signage and any associated temporary traffic management measures will be provided in accordance with Chapter 8 of the Traffic Signs Manual.

A Stage 1 Road Safety Audit was undertaken at the R492 and L1071 entrances, and its recommendations have been incorporated into the proposed access design. The site access arrangements are detailed in Section 14.4 of the EIAR, with the associated visibility and swept path measures presented in Sections 14.9.1.3 and 14.9.1.4. Construction access and egress procedures and traffic management signage are also set out in the TMP included in Appendix 2-2.

Accordingly, the submitted access design provides the required horizontal visibility and sufficient manoeuvring space to accommodate the anticipated construction traffic safely. Subject to the approval of Offaly County Council, the proposed temporary 60 km/h speed limit on the R492 will ensure that the available vertical visibility is appropriate during the construction phase. The proposed signage and traffic-management measures will also alert approaching drivers to construction activity at the site entrances.

2.3.10.2 SUITABILITY OF THE EXISTING ROAD NETWORK

Summary:

Submissions raised concerns regarding the suitability of the R492, N62, L1071 and adjoining local roads to accommodate construction traffic. Particular concerns related to road width, bends, restricted passing opportunities, limited hard shoulders, soft verges, the ability of two HGVs to pass and the operation of the N62/R492 crossroads. Submissions also questioned the identification of potential quarry sources, the concentration of quarry traffic on the N62 and R492 and the route descriptions referring to the L3246 and L3247.

Response:

The proposed construction haul routes were assessed having regard to their existing geometry, traffic conditions and ability to accommodate the construction vehicles associated with the

Proposed Project. This assessment is presented in Sections 14.3, 14.5 and 14.8 of Chapter 14: Traffic and Transportation of the EIAR.

The assessment recognises that the R492 is a relatively narrow rural regional road with limited hard shoulders and several bends. Notwithstanding these characteristics, the review of the road geometry demonstrates that the route can accommodate the standard construction HGVs anticipated during the construction phase. While localised narrower sections are present, construction deliveries will be scheduled and managed to minimise the likelihood of project HGVs meeting at these more constrained locations. The R492 therefore provides the most appropriate connection between the N62 and the proposed wind farm site. The R492 and bridge located on the R492 is in good condition with minor wearing of the surface course and a hump over the crown of the arch. The top of deck is noted to be in good condition. Any damage caused to the pavement on the existing national road network due to the turning movement of abnormal loads (e.g. tearing of the surface course) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority prior to the commencement of any development on site.

The N62 is an established national secondary road that accommodates existing commuter, freight and HGV traffic and provides the principal connection to the R492 construction haul route. Construction heavy vehicles will principally access the site via the N62 and R492. The L1071 will operate as a secondary access for localised works, maintenance activities and operational traffic and will not serve as the principal construction HGV route.

The potential quarry sources identified in the TTA are indicative because the final material suppliers will be confirmed following contractor appointment and procurement. The assessment considered potential sources to both the north and south of the Proposed Project and identified suitable routes connecting those sources to the site. Material will also be obtained from the proposed on-site borrow pits, reducing the quantity of stone that would otherwise require delivery over the public road network.

Regardless of which identified quarry ultimately supplies the imported material, construction deliveries approaching the site will converge onto the N62 and R492. The traffic-impact assessment adopted a conservative assumption that 100% of the peak construction traffic would pass through both the N62/R492 crossroads and the proposed R492 site access. The assessed traffic volumes and percentage increases are therefore not dependent on the selection of a particular quarry or approach direction.

The reference to the L3247 in the TMP provides additional detail concerning the route between the R433 and L3246. The L3247 forms the connecting section used to reach the L3246 from the R433 and does not represent a different or additional haul route from that assessed in the TTA. The route described in both documents ultimately continues via the L3246, N62 and R492 to the proposed site.

The appointed contractor and material suppliers will be required to use the approved construction haul routes. Any proposal to use a materially different route would require prior consultation with and agreement from the relevant Roads Authority and would be subject to any additional traffic-management requirements considered necessary.

Construction traffic will be dispersed throughout the working day, reducing the likelihood of two construction HGVs meeting along the more constrained sections of the route. Standard construction hours will generally be between 07:00 and 19:00 from Monday to Friday and between 07:00 and 14:00 on Saturdays. These hours provide a broad delivery window extending before the principal morning network peak and beyond the evening network peak, allowing staff movements and construction deliveries to be distributed rather than concentrated within the busiest periods.

For the traffic-impact assessment, a conservative worst-case scenario was adopted in which 20% of daily construction traffic was assumed to travel during the assessed network peak hours. On this basis, the Proposed Project would result in a maximum of 37 additional vehicle movements during the assessed peak hour in the peak construction scenario. This reduces to 22 additional vehicle movements during the assessed peak hour in the off-peak construction scenario. The majority of daily construction traffic will therefore occur outside the assessed network peak hours.

The N62/R492 crossroads was included in the traffic surveys and traffic-impact assessment. The assessment found that existing traffic volumes at the junction are relatively low and that sufficient capacity is available to accommodate the forecast increase in construction traffic. The detailed construction traffic volumes and their effects are addressed further in Section 14.3.

The TMP included in Appendix 2-2 sets out additional measures for managing construction vehicles on the road network. HGV movements will be restricted during identified peak road-network periods, including school travel periods, between 08:30 and 09:30 and between 16:30 and 17:30 from Monday to Friday, unless otherwise agreed in writing with Offaly and Tipperary County Councils. A submission was made in relation to works at Killeen school. The 50-week duration is for the full length of the GCR; therefore the school element will take considerably less time. In relation to concrete pours, there is no proposed routing of concrete trucks on the R489.

All construction drivers will be required to use the approved haul routes, and queuing or parking of construction vehicles on the public road will not be permitted. Suitable space will be provided within the site to allow construction vehicles to wait clear of the public road.

A controlled convoy system will also be used for HGVs departing the site, with a maximum of four HGVs released in each convoy. Traffic Management Operatives will control the release of vehicles, and appropriate separation will be maintained between successive convoys to avoid a continuous sequence of construction HGVs and to facilitate the movement of existing traffic along the public road.

The TMP does not propose the use of private residential or agricultural entrances as passing places. Where additional temporary traffic management is required at a constrained location, the measures will be developed by the appointed contractor in consultation with the relevant Roads Authority and An Garda Síochána and submitted for approval before implementation.

Accordingly, while the rural characteristics and constraints of the R492 and adjoining roads are recognised, the assessment demonstrates that the proposed construction routes can accommodate the anticipated construction vehicles. The assessment accounts for construction traffic from the potential quarry sources irrespective of the final supplier, and the contractor

will be required to use the approved haul routes. The distribution of construction traffic throughout the working day, together with the routing, scheduling and traffic-management measures contained in the TMP, will minimise the potential for conflict between construction HGVs and other road users.

2.3.10.3 CONSTRUCTION TRAFFIC VOLUMES, DURATION AND NETWORK CAPACITY

Summary:

Submissions raised concerns regarding existing traffic levels and the volume, frequency and duration of construction traffic. Particular concerns related to the number of HGV movements during peak construction and turbine foundation concrete pours and the potential for congestion and disruption on the N62, R492 and surrounding road network. Submissions also questioned the duration and representativeness of the traffic surveys, the use of a single-day junction turning count at the N62/R492 crossroads, differences between the traffic assumptions presented in the TTA and TMP, and the absence of detailed junction-capacity modelling.

Response:

Existing traffic conditions were established through traffic surveys undertaken as part of the Traffic and Transport Assessment. These included a Junction Turning Count at the N62/R492 crossroads and Automatic Traffic Counts at the proposed R492 and L1071 site access locations.

The traffic surveys were undertaken during May 2024, which is considered a neutral month for the collection of representative traffic data, as it falls outside the principal summer holiday period and is unaffected by seasonal school closures.

The Automatic Traffic Count on the R492 was undertaken between Wednesday, 15 May 2024 and Wednesday, 22 May 2024. Although the survey equipment was damaged after 16:00 on the final day, seven complete days of traffic information had already been recorded. The loss of data during part of the final survey day does not therefore materially affect the assessment.

The Automatic Traffic Count on the L1071 was undertaken between Thursday, 16 May 2024 and Wednesday, 29 May 2024, providing approximately two weeks of traffic information. Collectively, the surveys provided a sufficient sample of weekday and weekend traffic conditions at the proposed access locations, including daily traffic profiles, vehicle classifications, HGV proportions and vehicle speeds.

The Junction Turning Count at the N62/R492 crossroads was undertaken during a neutral weekday and covered the complete morning and evening network peak periods. Having regard to the forecast trip generation and the estimated percentage effect of the Proposed Project at the junction, additional multi-day junction turning counts were not considered necessary to establish the likely traffic effect.

At the N62/R492 crossroads, the surveys recorded a total approach flow of 685 vehicles during the morning peak hour of 08:15–09:15 and 747 vehicles during the evening peak hour of 17:00–18:00. At the proposed R492 site access location, 124 vehicles were recorded during the morning peak hour of 07:30–08:30 and 132 vehicles during the evening peak hour of 17:00–

18:00. The survey results demonstrate that existing traffic volumes, particularly along the R492 at the proposed site access, are relatively low.

Construction traffic generation and its effect on the surrounding road network were assessed in Sections 14.6 to 14.8 of Chapter 14: Traffic and Transportation of the EIAR. The assessment considered both the three-month peak construction period and the lower level of construction activity anticipated during the remainder of the 24-month construction programme.

During the peak construction period, the Proposed Project is forecast to generate 240 two-way light-vehicle movements associated principally with construction personnel and 54 two-way HGV movements per day. The peak construction period is anticipated to occur over approximately three months, from July to September 2027.

Outside this three-month period, construction traffic is forecast to reduce to 152 two-way light-vehicle movements and 30 two-way HGV movements per day. This lower level of traffic represents the remaining 21 months of the construction programme.

The traffic-impact assessment presented in EIAR Chapter 14 was based on an absolute worst-case vehicle-occupancy assumption of one construction worker per vehicle. This results in 240 two-way light-vehicle movements during the peak construction period and forms the basis of the assessed peak-hour traffic increases and reported effects on the road network.

The TMP refers to a potential practical vehicle occupancy of two construction workers per vehicle. This reflects how staff travel may be managed in practice following the appointment of the contractor and finalisation of the construction programme. It does not replace or reduce the worst-case scenario assessed in the TTA. If two construction workers travel in each vehicle, the number of staff vehicles generated by the Proposed Project would be lower than the number used in the traffic-impact assessment.

Similarly, the approximately 10 one-way HGV movements per day referenced in the TMP represent average construction activity, whereas the TTA assesses up to 27 one-way HGV movements per day during the peak construction period. The higher peak-construction figures presented in the TTA form the basis of the assessment of effects. Accordingly, the differences between the TTA and TMP reflect worst-case assessment assumptions compared with expected practical traffic-management arrangements and do not result in an underestimation of the potential traffic effects.

The durations assigned to individual construction activities in the TMP are indicative practical programme periods that will be refined following contractor appointment. The TTA considers the wider periods during which traffic associated with those activities could occur. Both documents are based on an overall construction period of approximately 24 months, and the traffic assessment adopts the more conservative assumptions when determining the potential effect on the road network.

Traffic will be distributed across the standard construction working hours of 07:00 to 19:00 from Monday to Friday and 07:00 to 14:00 on Saturdays. These hours provide a broad delivery window, allowing construction traffic to be dispersed throughout the day rather than concentrated during the network peak periods.

Notwithstanding this anticipated distribution, a conservative worst-case assumption was adopted in the traffic assessment whereby 20% of daily construction traffic was assumed to travel during the assessed network peak hours. On this basis, the Proposed Project would result in a maximum of 37 additional vehicle movements during the assessed peak hour in the peak construction scenario. This reduces to 22 additional vehicle movements during the assessed peak hour in the off-peak construction scenario.

At the N62/R492 crossroads, the forecast traffic increase is 5% during the peak construction scenario and 3% during the off-peak construction scenario. At the R492 site access, the forecast increases are 29% and 17%, respectively. The higher percentage increases at the R492 access reflect the very low existing traffic volumes recorded at that location rather than a high absolute number of additional vehicles.

Section 2.1 of TII Publication PE-PDV-02045, Traffic and Transport Assessment Guidelines (2014), identifies a general advisory threshold of 10% additional traffic on an adjoining road affected by a Proposed Project. A lower advisory threshold of 5% applies where congestion exists or where the location is sensitive. These thresholds are intended to assist in determining whether further detailed traffic assessment may be required and do not represent junction-capacity limits. The traffic surveys did not identify existing congestion or an operational capacity constraint at the N62/R492 crossroads. The forecast peak-construction increase at the junction reaches but does not exceed the lower 5% advisory threshold and remains below the general 10% threshold. During the remaining construction period, the forecast increase reduces to 3%.

The reference in the submissions to 202 vehicles recorded during the busiest 15-minute period does not represent a continuous hourly traffic flow. Multiplying this isolated 15-minute count by four would assume that the highest recorded 15-minute demand continued unchanged throughout the complete hour. The assessment appropriately used the recorded peak-hour traffic volumes, which account for the variation in traffic demand over the full assessment period.

Given the recorded operation of the junction, the maximum forecast increase of 37 vehicles during the peak construction period and the temporary duration of this scenario, detailed junction-capacity modelling was not considered proportionate or necessary.

The assessment concludes that the N62/R492 crossroads and R492 access have sufficient capacity to accommodate the forecast construction traffic. The peak construction traffic effect is classified in the EIAR as moderate negative and temporary, occurring over approximately three months. The lower average construction traffic effect during the remaining 21 months is classified as slight negative and short term. The construction-phase effects have therefore not been characterised as imperceptible; the imperceptible effect identified in the EIAR relates to the operational phase, during which traffic generation will be minimal.

Each turbine foundation will require a continuous concrete pour completed within a single day. Concrete-pour traffic will occur on a total of 11 days during the 24-month construction programme. On each concrete-pour day, approximately 93 HGVs will arrive at the site, representing 186 two-way HGV movements. This equates to an average of approximately nine HGV arrivals per hour, or approximately one arriving HGV every 6.6 minutes.

The increased HGV frequency associated with concrete pours will therefore be limited to 11 individual days and will not occur throughout the construction programme. On concrete-pour days, all other construction HGV movements will be limited to essential deliveries, with non-essential deliveries programmed to occur on other days of the construction programme. Concrete pours will also be staggered so that pours for different foundations do not occur concurrently.

The TMP included in Appendix 2-2 requires construction deliveries to be scheduled to avoid peak traffic periods where practicable. HGV movements will be restricted between 08:30 and 09:30 and between 16:30 and 17:30 from Monday to Friday, unless otherwise agreed in writing with Offaly and Tipperary County Councils. The local authorities and community will also be informed in advance of turbine foundation concrete pours.

Accordingly, although an increased frequency of HGV movements will occur on the 11 individual concrete-pour days, the traffic surveys demonstrate that the receiving road network currently carries relatively low traffic volumes. The survey programme provided sufficient baseline information to assess the access locations and the N62/R492 crossroads, and the forecast increase at the crossroads remains below the general 10% TII advisory threshold for further detailed assessment. Construction traffic will be temporary, distributed throughout the working day and managed through the delivery-scheduling and traffic-management measures contained in the TMP.

2.3.10.4 ROAD SAFETY AND VULNERABLE ROAD USERS

Summary:

Submissions raised concerns regarding the safety of pedestrians, cyclists, walkers, residents and other vulnerable road users during the construction phase, particularly along rural roads without footpaths or hard shoulders. Submissions also questioned the scope of the submitted Road Safety Audit, the duration and conditions of the site inspection, the status of the Feedback Form and whether the safety matters identified by the audit had been incorporated into the proposed access arrangements.

Response:

The rural nature of sections of the construction haul routes, including the limited provision of footpaths and hard shoulders, is recognised. Construction traffic will therefore be managed through the measures contained in the TMP included in Appendix 2-2 to minimise potential conflicts with pedestrians, cyclists and other road users.

An independent Stage 1 Road Safety Audit was undertaken for the proposed R492 and L1071 site entrances. A Stage 1 audit is appropriate to the preliminary design and planning stage of a development and is intended to identify potential road-safety issues that should inform the subsequent development of the design. It is not intended to constitute the final construction-stage audit.

The duration and weather conditions recorded for the RSA site inspection do not, in themselves, invalidate the audit. A Road Safety Audit is an independent examination of the proposed design, road layout and surrounding conditions rather than a traffic survey. Existing traffic volumes and

speeds were assessed separately through the Automatic Traffic Counts and Junction Turning Count undertaken as part of the Traffic and Transport Assessment.

The RSA identified matters relating to entrance visibility and traffic speeds, forward visibility, entrance geometry, livestock control and the interaction with an adjoining farm access. These matters have informed the proposed entrance arrangements shown on Drawings 11333-2050 and 11333-2051. The submitted design provides 3.0 m × 215 m horizontal visibility splays, vegetation removal and maintenance within the visibility areas, stock-proof fencing, gates set back from the public road, appropriate junction radii and sufficient internal waiting space for construction vehicles. Traffic Management Operatives will also be provided where required during peak construction activity.

The absence of a completed Feedback Form within the submitted RSA does not mean that the matters identified by the audit have been disregarded. The submitted planning drawings demonstrate the design measures incorporated in response to the identified safety matters. A Road Safety Audit Stage 2 for the developed design will be undertaken before construction commences, as recommended by the audit, and the associated Designer Response and Audit Team feedback will document how any remaining recommendations have been addressed.

All construction drivers will be required to use the approved haul routes and will receive information on the applicable traffic-management requirements as part of the site-induction process. Compliance with the applicable speed limits will be emphasised to all staff, suppliers and contractors. The Applicant will request that Offaly County Council introduce a temporary 60 km/h speed limit on the affected section of the R492 in the vicinity of the principal construction entrance for the duration of the construction phase. Subject to the Council's approval, the temporary speed limit and associated signage will be implemented in accordance with the applicable statutory procedures and Chapter 8 of the Traffic Signs Manual. Separately, construction vehicle drivers will be instructed not to exceed 60 km/h when travelling through other sensitive locations, including local community areas, where the posted speed limit is higher.

Clear advance warning and construction traffic signage will be provided on the approaches to the site and at relevant locations along the construction routes. This signage will advise road users of construction activity and of slower-moving construction vehicles entering, leaving or travelling along the road network.

Construction HGV movements will be distributed throughout the working day, and HGV movements will be restricted during the identified peak periods between 08:30 and 09:30 and between 16:30 and 17:30 from Monday to Friday, unless otherwise agreed in writing with Offaly and Tipperary County Councils.

Queuing or parking of construction vehicles on the public road will not be permitted. Staff vehicles will be parked within the designated parking areas provided in the construction compounds, including the temporary contractor's compound adjacent to the R492 entrance. Space will be provided within the site for HGVs to wait, and a controlled convoy system will be used for HGVs departing the site. Appropriate separation will be maintained between successive convoys to avoid a continuous sequence of construction HGVs and to facilitate the movement of existing traffic along the public road.

Where works adjacent to or within the public road require temporary traffic management, the arrangements will be developed by the appointed contractor in consultation with the relevant Roads Authority and An Garda Síochána. Depending on the location and nature of the works, these measures will include advance warning signage, temporary traffic signals, Stop/Go control and Traffic Management Operatives.

The operation of temporary traffic management will be monitored during construction. Where queuing or other safety concerns are identified, the traffic management arrangements and warning distances will be adjusted, as necessary.

Accordingly, the proposed access design, subsequent Road Safety Audit, speed management, signage, delivery scheduling, internal HGV waiting arrangements and temporary traffic management measures will reduce the potential for conflict between construction vehicles and vulnerable road users during the temporary construction phase.

2.3.10.5 SCHOOLS, SCHOOL TRANSPORT AND STUDENT SAFETY

Summary:

Submissions raised concerns regarding the interaction of construction traffic with school buses, students and other road users during school arrival and collection periods. Concerns were also raised regarding potential delays to school transport services and the need for consultation with schools and bus operators before construction.

Response:

The TMP included in Appendix 2-2 contains measures to manage construction traffic in the vicinity of schools and during school arrival and collection periods.

The submitted TMP provides for restrictions on HGV movements between 08:30 and 09:30 and between 16:30 and 17:30 from Monday to Friday, unless otherwise agreed in writing with Offaly and Tipperary County Councils. These periods correspond to identified road-network peak periods but are not intended to represent the operating hours of every school or school transport service within the study area.

The different arrival, collection and school-transport operating times identified in the submissions are noted. Before construction commences, the appointed contractor will liaise with the relevant schools and school transport operators to confirm their current arrival, collection and bus operating times. The final construction-stage TMP and delivery programme will be updated, where necessary, to reflect the confirmed school transport periods.

Construction HGV deliveries will be scheduled to avoid confirmed school arrival and collection periods where practicable. Where construction traffic or works cannot be avoided during these periods, appropriate site-specific traffic management will be implemented to maintain access and safely manage the interaction between construction vehicles, school buses, students and other road users.

The TMP requires construction traffic to use the approved haul routes and provides for construction vehicles to be directed away from schools and other sensitive locations where practicable. Construction drivers will be briefed on the approved routes and relevant school transport arrangements as part of the site induction process.

Clear advance warning signage will be provided at relevant locations. Construction vehicle drivers will be required to comply with posted speed limits and, in locations with a speed limit greater than 60 km/h, will be instructed to restrict their speed to 60 km/h when travelling through sensitive locations such as schools and local community areas.

Traffic Management Operatives, temporary traffic signals or Stop/Go control will be provided where required to manage construction traffic or roadworks near a school or on a school transport route. Queuing and parking of construction vehicles on the public road will not be permitted, and suitable waiting areas will be provided within the site.

Abnormal-load deliveries will generally take place at night, during periods of low background traffic, under controlled traffic management arrangements and Garda escort. These deliveries will therefore occur outside normal school transport periods.

Schools and school transport operators will be informed in advance of planned works, temporary traffic restrictions or delivery activities that could affect school access or bus operations. Where a temporary road closure is required, a suitable diversion route will be agreed with the relevant Roads Authority and communicated to the affected schools and transport operators before the closure is implemented.

The specific effects of Grid Connection Route trenching and temporary traffic management in the vicinity of affected schools are addressed separately in Section 14.6 of the EIAR.

Accordingly, the confirmed operating times of the affected schools and school transport services will inform the final construction delivery programme and traffic management arrangements. The proposed scheduling, consultation, speed management, signage and temporary traffic control measures will minimise disruption to school transport and provide for the continued safe operation of school access and bus services during construction.

2.3.10.6 GRID CONNECTION ROUTE WORKS

Summary:

Submissions raised concerns regarding the duration and progression of the Grid Connection Route works, open trenching, temporary road and lane closures, access to schools and properties, temporary surfacing and the potential for delays and disruption along the affected roads.

Response:

The proposed Grid Connection Route is approximately 12.23 km long, of which approximately 11.1 km will be installed within the public road corridor. The traffic effects associated with its construction have been assessed in Section 14.8.2.3 of Chapter 14: Traffic and Transportation of the EIAR.

The indicative rate of installation is approximately 250 m per week. At this rate, installation along the complete 12.23 km route would take approximately 49 weeks, rather than 90 weeks as suggested in one submission. However, the works will progress sequentially along the route, with no more than 100 m of trench open at any one time. The entire route will therefore not be subject to active trenching or traffic management simultaneously.

As the works progress, disruption at any individual property, school, junction or section of road will be limited to the period during which the active work area passes that location. Once each section has been installed, the trench will be backfilled, and the traffic management measures will move to the next section of the route.

Temporary road closures may be required on sections of the local road network, while temporary lane closures may be required along the R439. Any closure will be undertaken outside peak traffic periods and only for the duration of the working day. Local access will be maintained, and a suitable diversion route will be agreed with the relevant Roads Authority, An Garda Síochána and emergency services before a road closure is implemented.

The concerns raised regarding school arrival, collection and school-transport periods are acknowledged. Before works commence along the relevant sections of the GCR, the appointed contractor will liaise with the affected schools and school transport operators to confirm their operating times and access requirements. Works and associated traffic management will be scheduled to avoid confirmed school arrival and collection periods where practicable.

Where works are required in the vicinity of a school entrance, site-specific temporary traffic management will be prepared and agreed with the relevant Roads Authority in advance. The arrangements will provide for the continued safe movement of school buses, parents, students and other road users and will include Traffic Management Operatives, temporary signals, Stop/Go control and appropriate warning signage where required.

The trench will be suitably backfilled at the end of each working day and provided with appropriate temporary surfacing where required by the relevant local authority. No more than 100 m of trench will remain open at any one time. The condition of temporary surfaces will be monitored and maintained to ensure that they remain suitable for the vehicles using the route, including buses and other heavy vehicles.

Permanent trench reinstatement will be undertaken in accordance with the Guidelines for Managing Openings in Public Roads and the requirements of the relevant Roads Authority. The detailed construction methodology, phasing and reinstatement specification will be agreed with Offaly and Tipperary County Councils before the works commence, and the appointed contractor will obtain the necessary road-opening licences.

Residents, schools, transport operators and other affected stakeholders will be informed in advance of planned road closures or significant temporary traffic management measures in accordance with the notification requirements agreed with the relevant Roads Authority.

The potential cumulative interaction between the proposed GCR works and the Carrig Wind Farm grid connection is addressed separately in Section 14.14 of the EIAR.

The EIAR classifies the traffic effect associated with construction of the Grid Connection Route as moderate negative and temporary. The progressive nature of the works, restriction of the open trench to 100 m, maintenance of local access, provision of diversion routes and implementation of site-specific traffic management will limit disruption at any individual location along the route.

2.3.10.7 ROAD CLOSURES, DIVERSIONS AND MAINTENANCE OF LOCAL ACCESS

Summary:

Submissions raised concerns regarding potential road closures, diversions and temporary traffic management and their effects on access to homes, workplaces, businesses and other local destinations. Requests were also made for advance notification and pre-agreed alternative routes.

Response:

Temporary road or lane closures may be required to facilitate elements of the proposed works. Any closure will be implemented in accordance with the TMP included in Appendix 2-2 and subject to the approval and notification requirements of the relevant Roads Authority.

Road closures will be undertaken outside peak traffic periods and only for the duration of the working day. Before a closure is implemented, the appointed contractor will consult with the relevant Roads Authority and An Garda Síochána to agree an appropriate diversion route and the associated temporary traffic management arrangements.

Local access to homes, farms and businesses will be maintained throughout the construction phase. Where roadworks affect direct access from a property to the public road, the affected residents or property occupiers will be informed of the temporary arrangements for entering and leaving their properties. A Traffic Management Operative will be provided where assistance is required.

Where a lane closure is required, traffic will be managed using temporary traffic signals or a Stop/Go system operated by trained personnel. The maximum length of an active shuttle system, including tapers, will generally be limited to 500 m. Shorter working lengths will be used where necessary to control queues and reduce delays.

Queue lengths and traffic conditions will be monitored following implementation of the temporary traffic management. Warning distances, signal timings and the length of the active work area will be adjusted where necessary in response to observed conditions.

Temporary traffic management measures will be removed when the works are not in progress where it is safe and reasonably practicable to do so. The TMP also provides for the measures to be modified or removed in response to unusually high traffic volumes, adverse weather conditions or other circumstances requiring unrestricted access.

Affected residents, businesses, schools, transport operators and other stakeholders will be informed in advance of planned closures or significant temporary restrictions. The timing and method of notification will be agreed with the relevant Roads Authority and will reflect the nature and duration of the proposed restriction. The TMP also requires the provision of contact details for the developer's representative and an out-of-hours emergency contact number.

Accordingly, while temporary disruption may occur, closures will be limited to the period necessary to undertake the works, suitable diversion routes will be agreed in advance and access to adjoining properties will be maintained through the approved temporary traffic management arrangements.

2.3.10.8 EMERGENCY ACCESS, HEALTHCARE FACILITIES AND ESSENTIAL SERVICES

Summary:

Submissions raised concerns regarding the potential for construction traffic, road closures and temporary traffic management to delay emergency services or affect access to healthcare facilities, schools, residential care facilities and other essential services.

Response:

Access for emergency services and other essential users will be maintained throughout the construction phase in accordance with the TMP included in Appendix 2-2.

Emergency procedures and appropriate contact arrangements will be agreed with the local emergency services before construction commences. On notification of an emergency or other priority condition, all construction vehicles will be directed to give right of way to emergency vehicles until the need for priority access has passed. Ambulances and fire appliances will also be given priority access to and from the proposed wind farm site.

The TMP expressly requires emergency services to have ready access to properties along the construction haul routes and in the vicinity of the proposed works. This requirement will apply to residential care facilities, schools, residential properties, farms and other facilities dependent on the surrounding road network.

Construction vehicles will be distributed throughout the working day, and queuing or parking of construction vehicles on the public road will not be permitted. Suitable waiting areas will be provided within the site, reducing the potential for construction vehicles to obstruct the R492, N62 or other roads used by emergency and healthcare services.

Where temporary lane closures are required, traffic will be managed using temporary signals or trained Stop/Go operators. Traffic Management Operatives will be instructed to give priority to emergency vehicles. Temporary traffic management may also be modified or removed where necessary to facilitate emergency access.

Before any temporary road closure is implemented, the appointed contractor will consult with the relevant Roads Authority, An Garda Síochána and emergency services to agree a suitable diversion route. Closures will be undertaken outside peak traffic periods and only for the duration of the working day. Local access will be maintained in accordance with the measures set out in Section 14.7.

Facilities and service providers likely to be affected by a planned closure or significant traffic management measure will be informed in advance. The notification arrangements will identify the nature and duration of the restriction, the approved diversion route and the relevant contractor contact details. An out-of-hours emergency contact number will also be provided.

The contractor will liaise with healthcare and residential care facilities directly affected by the works to identify essential access requirements, including ambulance access, healthcare visits, staff shift changes and essential deliveries. These requirements will be incorporated into the relevant site-specific temporary traffic management arrangements.

Accordingly, emergency vehicles will retain priority over construction traffic, local access will be maintained, and road closures and temporary traffic management will be planned in consultation with the relevant authorities and emergency services. These measures will ensure that emergency response and access to healthcare and other essential services are maintained during construction.

2.3.10.9 AGRICULTURAL ACTIVITIES AND FARM ACCESS

Summary:

Submissions raised concerns regarding the interaction of construction traffic with agricultural activities, including access to farmyards, the movement of cattle and farm machinery and the potential use of private entrances or verges by construction vehicles.

Response:

Access to farms, fields and agricultural properties will be maintained throughout the construction phase in accordance with the TMP included in Appendix 2-2.

Construction drivers will be required to use the approved haul routes and will not be permitted to park, queue or unload on the public road in a manner that obstructs agricultural accesses. Suitable areas will be provided within the proposed wind farm site for construction vehicles to wait clear of the public road.

Private residential and agricultural entrances are not proposed as passing or waiting places for construction HGVs. Construction vehicles will not be permitted to enter or use private property unless the necessary agreement has been obtained from the landowner.

Construction HGV movements will be dispersed throughout the working day. A controlled convoy system will be used for HGVs departing the site, with appropriate separation maintained between convoys. This will reduce the frequency of isolated outgoing HGV movements and allow construction traffic to be managed in a more coordinated manner alongside existing agricultural and local traffic.

Where temporary traffic management or roadworks could affect a farm or field access, the appointed contractor will liaise with the affected landowner or occupier in advance. The temporary traffic management arrangements will identify how access will be maintained while the works are in progress.

Where a shuttle system or Stop/Go arrangement is operating, Traffic Management Operatives will facilitate vehicles entering or leaving affected properties. The traffic management measures may also be adjusted where necessary to accommodate known agricultural access requirements and the movement of livestock or farm machinery.

Advance warning signage will be provided to alert construction drivers and other road users to construction activity and slower-moving vehicles. All construction drivers will be required to comply with posted speed limits and the traffic management requirements contained in the TMP.

Accordingly, access to agricultural properties will be maintained, construction vehicles will be prevented from obstructing farm entrances, and temporary traffic management will be

coordinated with affected landowners to minimise interference with existing agricultural activities.

2.3.10.10 ABNORMAL INDIVISIBLE LOADS AND THE TURBINE DELIVERY ROUTE

Summary:

Submissions raised concerns regarding the delivery of turbine components, the ability of abnormal-load vehicles to negotiate constrained junctions and sections of road, potential disruption through Roscrea, the use of private land at Sharavogue crossroads and whether all necessary Turbine Delivery Route works were included in the assessment. Submissions also questioned the exclusion of AIL movements from the quantitative traffic increases and whether swept-path analysis adequately demonstrates the safe operation of the delivery route.

Response:

Swept-path analysis demonstrates that the proposed abnormal-load vehicles can negotiate the Turbine Delivery Route from Foynes Port to the Ballincor Wind Farm site, subject to the implementation of the temporary accommodation works identified in the assessment. The swept-path assessment is presented in the Pell Frischmann report Offaly Wind Farm – Abnormal Indivisible Load Route Survey, with the individual route assessments shown on Drawings SK01 to SK19A. The analysis considered the transportation of the Nordex N163 blade and tower components, including an 81.5 m turbine blade representing the longest component proposed to be transported along the route.

AIL movements were not included in the peak-hour percentage traffic increases because they will not take place as part of normal daytime construction traffic. AIL deliveries were assessed separately, having regard to their dimensions, route requirements, swept paths, temporary accommodation works and controlled delivery arrangements. Their exclusion from the peak-hour traffic calculations does not therefore represent an omission from the traffic and transportation assessment.

Swept-path analysis is the established method for determining whether the proposed delivery vehicles can physically negotiate the identified route and for defining the extent of any accommodation works required. The analysis is not relied upon in isolation to manage operational safety. During each delivery, conflicting traffic will be controlled by An Garda Síochána and trained traffic-management personnel, allowing the abnormal-load vehicles to undertake the assessed manoeuvres without interacting with uncontrolled opposing traffic.

The assessment identified each location at which temporary accommodation works will be required. These works include vegetation trimming, the temporary removal or demounting of signs and lighting columns and the installation of temporary load-bearing surfaces. The identified works will provide the clearance and manoeuvring space required for the abnormal-load vehicles.

At Sharavogue crossroads, the swept path analysis identified that an offline access track is required to provide the turning radius necessary for turbine delivery vehicles to enter the R492. The temporary access track and the associated works on third-party private land at this location form part of the planning application.

The requirement for temporary accommodation works at Sharavogue crossroads does not indicate that the delivery route is unsuitable. It demonstrates that the required turning area has been identified, assessed and incorporated into the application. The offline track will be used only for the controlled turbine delivery operation and will be reinstated following completion of the deliveries.

The complete Turbine Delivery Route and the temporary works required along it were considered in the Turbine Delivery Route Assessment and the EIAR. Temporary works within the public road corridor will require the relevant road authority consents, licences and approvals before implementation. This subsequent approval process relates to the detailed execution of the works and does not represent an omission of those works from the environmental assessment.

Road authority approvals, abnormal-load permits and Garda coordination are standard implementation requirements for abnormal-load movements. These approvals will confirm the final delivery dates, escort arrangements and temporary traffic-management details but do not alter the route or accommodation works assessed as part of the planning application.

Turbine components will be transported in controlled convoys of between three and five abnormal-load vehicles. Deliveries will generally take place at night, when background traffic volumes are lower, and will be undertaken under Garda escort and site-specific traffic management. The detailed delivery programme will be agreed in advance with An Garda Síochána, the relevant Roads Authorities, motorway operators and maintenance contractors.

The section of the Turbine Delivery Route passing through Roscrea will be managed as part of the same controlled delivery operation. Deliveries will take place during periods of low background traffic, and temporary traffic holds will be implemented where required to allow the abnormal-load convoy to pass constrained locations safely. This will avoid interaction with normal peak traffic and minimise the potential for congestion or disruption within the town.

Although night-time delivery reduces interaction with general traffic, the associated safety requirements have also been considered. The delivery operation will include advance warning signage, appropriate lighting, Garda escort and trained traffic-management personnel. Affected authorities and communities will be informed in advance of the delivery programme in accordance with the notification arrangements set out in the TMP.

The proposed route swept path analysis and required temporary accommodation works are detailed in Section 14.5.5 of Chapter 14: Traffic and Transportation and in the Turbine Delivery Route Assessment submitted with the planning application. The delivery and traffic-management procedures are also set out in the TMP included in Appendix 2-2.

Accordingly, the assessment confirms that the turbine components can be delivered safely to the Proposed Project site and that the temporary works necessary to facilitate those deliveries have been identified and assessed as part of the planning application. The combination of swept-path assessment, temporary accommodation works, off-peak scheduling, Garda escort and site-specific traffic management provides for the safe and controlled operation of the complete Turbine Delivery Route.

2.3.10.11 PERMANENT ABNORMAL-LOAD ROUTE MODIFICATIONS

Summary:

Submissions from haulage representatives requested that the accommodation works required for turbine deliveries be constructed as permanent load-bearing facilities rather than installed temporarily and subsequently removed.

Response:

Permanent alterations to the affected junctions and roundabouts are not required to facilitate the delivery of turbine components for the Proposed Project. The Turbine Delivery Route Assessment demonstrates that the abnormal-load vehicles can negotiate the route through the identified temporary accommodation works and controlled delivery arrangements.

The proposed temporary works are proportionate to the limited duration and frequency of the turbine delivery operation. These works will provide the necessary manoeuvring area and clearance during the deliveries while allowing the affected road infrastructure and verges to be reinstated following completion.

The provision of permanent Grasscrete tracks, access gates or other abnormal-load infrastructure for use by unrelated industries or future projects would extend beyond the transport requirements and mitigation needs of the proposed Ballincor Wind Farm. Any proposal for a permanent strategic abnormal-load route would require separate consideration by TII and the relevant Roads Authorities, including assessment of its design, ownership, maintenance, safety and environmental implications.

Although turbine components may require removal at the end of the Proposed Project's operational life, the condition, layout and regulatory requirements of the road network may change over the intervening 35-year period. As set out in Chapter 14 of the EIAR, the Turbine Delivery Route will therefore be reassessed before any future transport of large replacement components or decommissioning loads.

The appointed contractor will consult with TII and the relevant Roads Authorities before implementing the temporary accommodation works. Should a road authority require a different treatment at a particular location, this will be addressed through the relevant consent and technical approval process.

Accordingly, permanent modifications are not necessary to facilitate the proposed turbine deliveries. The temporary works identified in the submitted assessment provide an appropriate and proportionate means of accommodating the project-specific abnormal loads.

2.3.10.12 ROAD CONDITION, MAINTENANCE AND REINSTATEMENT

Summary:

Submissions raised concerns regarding potential deterioration of road surfaces, edges and verges as a result of construction traffic and grid connection works. Requests were made for road condition surveys, ongoing maintenance and appropriate temporary and permanent reinstatement. Submissions also questioned the absence of structural pavement testing and

requested continuous monitoring and specific requirements for wheel-washing and entrance surfacing.

Response:

Any damage to the public road network demonstrated to be attributable to construction of the Proposed Project will be repaired at the Applicant's expense. The affected road will be reinstated to its pre-construction condition as a minimum, or to such other standard as may be required by the relevant Roads Authority, with the scope of the required works agreed with the relevant Roads Authority.

Standard construction HGVs will comply with the applicable statutory axle-loading requirements and will use the approved construction haul routes. The existing regional and national roads forming the haul routes already accommodate legally loaded HGV traffic. The suitability of the routes was assessed having regard to their existing geometry, condition, traffic levels and ability to accommodate the anticipated construction vehicles.

Detailed pavement coring, California Bearing Ratio testing or residual-life analysis is not normally required to determine the traffic effect of legally loaded construction vehicles on an existing public road. However, should the relevant Roads Authority identify a particular section requiring further investigation before construction, any additional pavement assessment requirements will be agreed with the Roads Authority as part of the pre-construction road-condition survey and road-protection arrangements.

Pre-construction visual pavement condition surveys will be undertaken along the construction haul routes before construction traffic commences. These surveys will provide a record of the existing road condition against which any subsequent deterioration can be assessed. Post-construction surveys will be undertaken following completion of the works, with the timing and scope of the surveys agreed in advance with Offaly and Tipperary County Councils. Where considered necessary by the relevant Roads Authority, the agreed survey scope will include supplementary pavement testing at identified locations.

The pre-construction surveys will record the condition of the carriageway surface, road edges, verges and other relevant road features along the agreed survey routes. The survey records will provide an evidence base for distinguishing pre-existing defects from deterioration attributable to construction traffic or works associated with the Proposed Project.

The road network in the vicinity of the Proposed Project will also be visually inspected during construction. Where deterioration or damage associated with construction traffic is identified, appropriate maintenance or repair works will be agreed with the relevant Roads Authority rather than deferred until the end of the complete construction programme.

Monitoring during construction will allow defects such as edge deterioration, surface damage, trench settlement or material deposited on the carriageway to be identified and addressed promptly. Where an immediate safety concern is identified, the affected area will be made safe and the necessary temporary or permanent repair will be undertaken in consultation with the relevant Roads Authority.

Construction vehicles will not be permitted to use private residential or agricultural entrances as informal lay-bys or passing places. Queuing and waiting areas will be provided within the

proposed wind farm site to prevent construction vehicles from parking on the public road or adjoining private property.

The TMP included in Appendix 2-2 also provides for road cleaning during construction. Wheel-washing facilities will be provided within the site, and road sweeping will be undertaken where mud, stone or other construction-related material is deposited on the public road.

The submitted application includes a dedicated temporary wheel-wash facility, as shown on Drawing 11333-2040. Construction vehicles will be cleaned before leaving the site where necessary to prevent mud and loose material from being transferred onto the public road. The wheel-wash location and operation will be coordinated with the internal access layout so that vehicles can be cleaned and can wait within the site without obstructing the public road.

The final location and operational details of the wheel-wash facility, together with the extent and specification of any bound surfacing required at the construction entrance, will be agreed with the relevant Roads Authority before the main construction HGV movements commence. The objective of these measures will be to ensure that construction vehicles can enter and leave the site safely without depositing mud, stone or other material on the public road. The effectiveness of the wheel-wash and road-cleaning measures will be monitored throughout construction, and the arrangements will be adjusted where required.

For the Grid Connection Route, open trenches will be suitably backfilled at the end of the working day and provided with appropriate temporary surfacing where required by the relevant Roads Authority. Temporary surfaces will be monitored and maintained until permanent reinstatement is completed.

Permanent trench reinstatement will be undertaken in accordance with the Guidelines for Managing Openings in Public Roads and the requirements of the relevant Roads Authority. The construction methodology, phasing and reinstatement details will be agreed with Offaly and Tipperary County Councils, and the appointed contractor will obtain the required road-opening licences before commencing works within the public road.

The requirement is to repair damage attributable to the Proposed Project and reinstate affected roads to their pre-construction condition as a minimum, or to such other standard as may be required by the relevant Roads Authority. Any wider upgrading of the existing road network that is unrelated to damage caused by the Proposed Project would be a matter for the relevant Roads Authority and is not required to mitigate the effects of the Proposed Project.

These road-protection and reinstatement commitments are set out in Sections 14.9.1.6 and 14.9.1.7 of Chapter 14: Traffic and Transportation and in the TMP included in Appendix 2-2. Accordingly, the condition of the affected roads will be recorded before construction, monitored during the works and restored where project-related damage is identified. These measures provide for the timely identification, maintenance and reinstatement of the affected roads throughout the construction phase, rather than relying solely on a post-construction inspection.

2.3.10.13 *CONSULTATION, COMMUNICATION AND ADVANCE NOTICE*

Summary:

Submissions requested consultation with affected residents, schools, transport operators, healthcare providers and other stakeholders before construction. Requests were also made for advance notification of road closures, temporary restrictions, concrete pours and abnormal-load deliveries.

Response:

A formal communication and liaison process will be established before construction commences to ensure that affected stakeholders are informed of construction activities and associated traffic management measures.

The TMP included in Appendix 2-2 will be developed into a detailed construction-stage TMP by the appointed contractor before construction commences. The detailed TMP will incorporate the relevant planning conditions, the final construction programme and the traffic-management requirements agreed with Offaly and Tipperary County Councils.

The appointed contractor will identify the residents, schools, school transport operators, healthcare providers, businesses and other stakeholders that could be directly affected by construction traffic or works within the public road. Appropriate contact arrangements will be established with these stakeholders before the relevant works commence.

The contractor will liaise directly with the affected schools and school transport operators to confirm arrival, collection and bus operating times. These times will inform the detailed delivery programme and site-specific traffic management arrangements. The communication process will also identify the appropriate contact person for reporting any operational or safety concerns during construction.

Advance notice will be provided of planned road closures, significant temporary traffic restrictions, concrete foundation pours and abnormal-load deliveries. Notices will describe the nature and anticipated duration of the activity, any approved diversion or access arrangements and the relevant contractor contact details.

The appropriate notification period will be agreed with the relevant Roads Authority and affected stakeholders, having regard to the nature, location and duration of the planned works. This will allow sufficient time for residents, schools, transport operators, healthcare facilities and businesses to make alternative arrangements where necessary.

Notification will be provided through appropriate channels, including direct liaison with affected stakeholders, local notices and public postings. A contact number for the developer's representative will be provided for queries during working hours, together with an out-of-hours emergency contact number.

A detailed programme of turbine component deliveries will be submitted to Offaly and Tipperary County Councils before the deliveries commence. Abnormal-load movements will also be coordinated with An Garda Síochána, the relevant Roads Authorities, motorway operators and maintenance contractors.

Detailed temporary traffic management proposals will be prepared by the appointed contractor and submitted to the relevant Roads Authority for approval before works take place. These

proposals will be developed having regard to the access and operational requirements identified through consultation with affected stakeholders.

Accordingly, the final construction programme and traffic management arrangements will be supported by ongoing liaison, advance notification and identified points of contact throughout the construction phase.

2.3.10.14 CUMULATIVE TRAFFIC AND TRANSPORTATION EFFECTS

Summary:

Submissions raised concerns regarding potential cumulative traffic and transportation effects arising from the Proposed Project in combination with Carrig Wind Farm, the associated grid connection works and the Water Supply Project (WSP) – Eastern and Midlands Region. Particular concerns related to the simultaneous use of the same roads, overlapping grid connection works, congestion, road safety and disruption to schools, residents and other local road users. Specific concerns were raised regarding the Water Supply Project pipeline works near the Ballincor area, the proposed pipe storage depot at Boveen and the potential combined use of the N62 and R492 by construction traffic associated with both projects.

Response:

The cumulative assessment presented in Section 14.11 of the EIAR considered Carrig Wind Farm and its associated 38 kV grid connection, the proposed Clondallow BESS, smaller residential and agricultural developments identified through a review of the relevant planning registers and forecast background traffic growth. While the WSP project is large, it is distributed across five counties and works required for the WSP pipeline are limited in time and extent (installation of the pipeline) to the south of proposed wind farm. The assessment concluded that the cumulative traffic effect associated with the committed developments considered would be not significant/slight negative. The components of the Water Supply Project with the greatest potential relevance to Ballincor are the pipeline works in the Ballincor and wider Birr area, the proposed pipe storage depot at Boveen, the proposed Booster Pumping Station at Coagh Upper and the construction compounds and delivery routes associated with those works. The remaining principal infrastructure sites forming part of the Water Supply Project are geographically removed from Ballincor and are unlikely to interact directly with the local construction activities associated with the Proposed Project.

The proposed Boveen pipe storage depot would access the N62, while sections of the Water Supply Project pipeline and associated construction activity are located within the wider area surrounding the Proposed Project. Consequently, the potential for construction traffic associated with the two projects to use sections of the same regional road network, including the N62 and potentially the R492, subject to the final construction delivery routes adopted for the Water Supply Project, is acknowledged.

The precise level of interaction would depend on both projects receiving permission, the appointment of their respective contractors, the final construction programmes, the active sections of pipeline works and the delivery routes in operation at a particular time. The existence of a potential shared route does not mean that the peak construction traffic

associated with both projects would occur simultaneously or throughout their respective construction periods.

The Traffic and Transport Assessment demonstrates that traffic generated by the Proposed Project will be temporary and relatively low in the context of the existing road network. During the assessed peak construction period, the Proposed Project would result in a maximum increase of 37 vehicle movements during the network peak hour. Outside the peak construction period, this would reduce to a maximum increase of 22 vehicle movements during the network peak hour. These figures represent a worst-case assessment.

At the N62/R492 crossroads, the Ballincor traffic represents a forecast increase of 5% during the temporary peak construction period, reducing to 3% during the remainder of the construction programme. The contribution of the Proposed Project to traffic on the shared regional road network would therefore be relatively limited, even before the application of delivery scheduling and traffic-management measures.

Construction traffic will also be dispersed throughout the working day. The construction working hours extend beyond the morning and evening network peak periods, providing a broad delivery window within which construction traffic can be scheduled and avoiding the concentration of movements during the busiest periods. HGV deliveries will be limited to those required for the relevant construction activities and will be scheduled and coordinated in accordance with the TMP.

The higher HGV movements associated with turbine foundation concrete pours will be limited to 11 individual days during the approximately 24-month Ballincor construction programme. On those days, non-essential Ballincor HGV deliveries will be programmed to occur on other days. The concrete-pour programme will also be coordinated with other construction projects using the surrounding road network to avoid coinciding, where practicable, with periods of intensive pipeline deliveries or other major construction activity.

Should Ballincor Wind Farm and the Water Supply Project receive permission and their construction programmes overlap, the Ballincor contractor will liaise with the Water Supply Project contractor, the relevant Roads Authorities and An Garda Síochána before works commence on any shared or adjoining section of the road network. Delivery programmes, road closures, diversion routes and temporary traffic-management arrangements will be coordinated to avoid conflicting works and maintain local and emergency access.

This coordination will include confirming the active Water Supply Project work areas and storage depots, the roads being used for pipeline and material deliveries, proposed periods of intensive HGV activity and any planned traffic restrictions. The Ballincor delivery programme and temporary traffic-management arrangements will be adjusted where necessary to avoid simultaneous peak activity or conflicting restrictions on the same section of road.

Accordingly, even if limited temporal and geographical overlap occurs between the identified developments, the relatively low and temporary traffic generated by Ballincor Wind Farm, the limited duration of its most intensive HGV activities, the separation of the principal construction areas and the proposed coordination and traffic-management measures mean that a significant cumulative traffic and transportation effect is not anticipated. Section 14.11 of the EIAR concludes that the cumulative effect associated with the committed developments considered

in the submitted assessment would be not significant/slight negative. Having regard to the currently available information regarding the Water Supply Project and the additional coordination measures identified above, a significant cumulative traffic effect involving that project is also not anticipated.

The Carrig Wind Farm grid connection uses parts of a similar route towards Dallow 110 kV Substation, including sections of the N52 and R489. This was considered during the development of the Ballincor Grid Connection Route. Due to the presence of existing cables and the proposed Carrig 38 kV cable within the L-70152, the Ballincor Grid Connection Route is proposed parallel to the L-70152 rather than within that section of the public road. This design reduces the potential for conflicting works within the same section of local road.

Should the construction programmes for Carrig Wind Farm and Ballincor Wind Farm overlap, the respective works on shared or adjoining sections of the road network will be coordinated. In accordance with the TMP included in Appendix 2-2 of the EIAR, the appointed contractor will liaise with the relevant Roads Authorities and the management of other construction projects to coordinate deliveries, road closures, diversion routes and temporary traffic-management arrangements. This will avoid simultaneous closures or conflicting traffic-management arrangements and will maintain access for local residents, schools, businesses and emergency services.

2.3.10.15 Construction Traffic Assessment and Management

The submission from OCC includes comments relating to the use of the local road network for construction traffic, the management of turbine deliveries and the protection of the local road network during construction. In response, construction traffic associated with the Proposed Project has been fully assessed within EIAR Chapter 14 (Traffic and Transportation).

Traffic surveys undertaken as part of the assessment confirmed that baseline traffic volumes on the surrounding road network are relatively low. The assessment indicates that the majority of construction traffic will consist of light vehicles associated with construction personnel, while heavy goods vehicles represent a relatively small proportion of total traffic movements.

Construction traffic and turbine deliveries will be managed through the implementation of a Construction TMP (TMP) included in EIAR Appendix 2-2. The TMP outlines procedures for scheduling deliveries, managing abnormal load movements, implementing temporary traffic management measures and protecting the condition of the road network.

A pre-construction road condition survey will be undertaken along the construction haul routes and a post-construction survey will also be completed following construction. Where any damage to the road network is identified as being attributable to construction traffic associated with the development, this will be addressed and rectified in agreement with the relevant local authority.

2.3.11 Conclusion

The Applicant recognises and welcomes County Offaly's significant contribution to Ireland's renewable-energy transition and accepts the importance of the County's plan-led approach to renewable-energy development.

However, the fact that Offaly has exceeded a wind-energy target established in an earlier national policy context, together with the existence of a substantial pipeline of projects at differing stages of maturity, does not establish that further wind-energy development in the County is unnecessary, that the current national and regional requirements have been achieved, or that the particular circumstances of the Ballincor Wind Farm cannot justify the exercise of the Commission's section 37G(6) discretion.

The Commission's assessment should recognise the CDP designation and the concerns expressed by the Planning Authority, but should equally engage substantively with the current national and regional renewable-energy framework, the quantifiable contribution of Ballincor, its grid and storage infrastructure, the particular characteristics of the site and the detailed environmental evidence submitted with the application.

The Applicant respectfully submits that the proposed Ballincor Wind Farm should be assessed on its individual merits having regard to the environmental assessments undertaken, the proposed mitigation measures, national renewable energy and climate policy objectives, and the strategic nature of the development. In that context, the Applicant considers that sufficient grounds exist under section 37 to justify a grant of permission.

2.4 TIPPERARY COUNTY COUNCIL

We wish to acknowledge Tipperary County Council's conclusion that the two turbines situated within its administrative area are located on lands designated as "Areas Unsuitable for New Wind Energy Development" under Map 11 of the Tipperary Renewable Energy Strategy 2016 and that the project appears to give rise to a material contravention of the Tipperary County Development Plan 2022 (CDP). This issue was expressly identified in the Planning Statement accompanying the planning application and is not disputed.

We would note however, that the Planning Authority does not recommend refusal of the project, but requests An Coimisiún Pleanála to engage fully with its acceptability having regard to the CDP and all other relevant planning policy and legislative requirements. The Applicant respectfully agrees that such full engagement is required.

Section 37G(6) of the Planning and Development Act, 2000, as amended, expressly empowers the Commission to grant permission notwithstanding a material contravention of a development plan. As confirmed by the Supreme Court in *Coolglass*, the exercise of that function is subject to section 15 of the Climate Action and Low Carbon Development Act, and where the matter is raised the Commission must consider whether the climate benefits and particular features of the specific development justify the grant of permission notwithstanding the contravention. The existence of a material contravention should not in itself operate as a reason for refusal.

In addition, it is noted that the current Tipperary Renewable Energy Strategy was adopted in 2016 and Tipperary Council recognises that, having regard to legislative changes since 2016 and the adoption of the Local Authority Climate Action Plan 2024–2029, it is necessary to review and update this Renewable Energy Strategy. We believe that this should be considered by the Commission, when exercising its powers with respect to material contravention, as stated above under section 37G(6) of the Act.

Furthermore, we would highlight that the relevant national policy context for the project has evolved through the First Revision of the National Planning Framework. The revised NPF establishes additional regional renewable-electricity capacity requirements, including an additional 978 MW allocation of onshore wind capacity for the Southern Region, and requires regional and local planning policy to make provision for sufficient renewable-energy development, taking account of project attrition and energised capacity. As such, we would argue that the designation of "Areas Unsuitable for New Wind Energy Development" should be considered within this evolving national and regional policy framework.

Separately, we note the Planning Authority's observation that other lands within County Tipperary are identified as "Open for Consideration". The availability of such areas is acknowledged but does not determine the acceptability of this project. In particular, the two turbines situated within Tipperary do not constitute a separate two-turbine wind farm capable of being considered in isolation. Instead, they form an integral component of a single eleven-turbine cross-boundary Strategic Infrastructure Development, with nine turbines situated in County Offaly and two in County Tipperary. The overall layout has been developed through project-specific environmental, technical and planning assessment. The existence of strategically preferred lands elsewhere does not establish that these two turbines could simply be relocated to an unrelated location while retaining the characteristics, functionality and environmental performance of the overall project.

As set out in section 4.2 of the Planning Statement which accompanies this planning application, the CDP is supportive of renewable-energy generation and associated infrastructure. Policies 10-1 and 10-A support renewable-energy development and recognise its strategic benefits; Policy 10-C expressly provides for continued support for renewable development through review of the RES; and Policies 15-E and 15-F support electricity infrastructure, renewable-energy integration and storage. The application must therefore be considered against the CDP as a whole.

The Applicant submits that the acknowledged material contravention does not, of itself, warrant refusal and that the particular circumstances of the Ballincor Wind Farm justify the exercise of the Commission's discretion under section 37G(6).

2.4.1 Landscape and Visual Impact Assessment (LVIA)

Summary:

Tipperary County Council made the following comment in relation to LVIA which also reflects the sentiments of the OCC observation;

"The proposed wind turbines will be significant and dominant features in the landscape particularly to road users and nearby residents and will alter the landscape character."

Response:

As detailed above in section 2.3.5, the LVIA for the proposed development, which was carried out in accordance with relevant guidance and best practice, acknowledged that nearby residential receptors would be negatively impacted. Effects at representative viewpoints in the local context registered up to a Moderate effect in three instances and Substantial-moderate degree in one instance. However, the LVIA notes that such effects are localised and are deemed

not significant in EIA terms. Neither the OCC nor TCC observation cites relevant guidance or references which parts of the LVIA approach / methodology it disagrees with to arrive at an alternative conclusion.

A key consideration is that the setback of the proposed turbines complies with the 4 X tip height set back requirement of the Draft Revised Wind Energy Development Guidelines (2019). This setback distance in this instance for the proposed 180 m tip height turbines is 720 m. The prescribed minimum setback distance has been established on the basis of avoiding significant effects on residential amenity, which includes residential visual amenity.

For the reasons outlined above and in Chapter 12 LVIA, the assessment is based on best practice and national policy for wind energy development.

2.4.2 Grid

Summary:

Tipperary County Council note the proposed grid connection overlaps for approximately 9 km with the approved Carrig Wind Farm grid route. The Council argues that constructing two separate high-voltage connections in the same rural roads corridor is not desirable and recommends a shared grid connection to avoid major disruption.

Response:

The applicant acknowledges Tipperary County Council's observations regarding the overlap between the proposed Ballincor Wind Farm grid connection and the consented Carrig Wind Farm grid connection. The applicant confirms that the design of the grid connection will need to comply with EirGrid and ESB Networks technical requirements, including all relevant standards relating to cable separation distances, thermal performance, constructability, future maintenance and operational safety.

As part of the detailed design process, opportunities for co-location and route optimisation will be examined in consultation with EirGrid, ESB Networks and the relevant road authorities. The applicant is committed to avoiding unnecessary duplication of infrastructure where a technically feasible, safe and environmentally acceptable solution can be achieved.

It should be noted, however, that the route assessed as part of the Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS) and planning application represents the Proposed Project before An Coimisiún Pleanála. Any material alteration to the grid connection route arising from detailed engineering review, including any significant co-location arrangement with other projects, would need to be assessed in accordance with the applicable planning and environmental legislation. Where such changes fall outside the scope of the permitted development, they would require an amendment to, or further consent in respect of, the approved development before implementation.

Accordingly, while the applicant will continue to engage with the relevant stakeholders regarding co-location opportunities, any final grid connection arrangement must comply with EirGrid and ESB Networks standards and remain within the scope of the development authorised by An Coimisiún Pleanála, or otherwise be subject to the appropriate amendment or consent process.

2.4.3 Biodiversity and Hydrology

2.4.3.1.1 Marsh Fritillary

Summary:

The planning authority raises concerns regarding the confirmed presence of Marsh Fritillary breeding colonies within the Proposed Project site and considers that the assessment does not adequately address the role of the site within the wider Marsh Fritillary metapopulation. Concerns are also raised regarding whether the loss or disturbance of occupied habitat could affect the conservation status of the species at a local or regional scale.

Response:

The concerns regarding Marsh Fritillary are acknowledged and overlap with those raised previously by the Department and Offaly County Council. The adequacy of the survey data, predicted effects and the application of the mitigation measures, have been addressed in detail in those preceding responses and read in conjunction with this response.

The submitted Biodiversity Chapter confirmed breeding Marsh Fritillary within the Proposed Project site and consequently assessed the species as a sensitive ecological receptor. The potential loss and degradation of occupied habitat was recognised within the assessment, with the unmitigated effect conservatively assessed as profoundly negative and permanent. The assessment therefore did not rely on an assumption that the site was of limited importance to the species.

The proposed mitigation measures proposed seek to maintain the local population and availability of suitable habitat through avoidance and protection of occupied areas where practicable, together with management and enhancement of approximately 2.8 ha of suitable wet grassland habitat. These measures are supported by pre-construction surveys and long-term monitoring of larval webs and habitat condition.

While the specific role of the population within the wider Marsh Fritillary metapopulation is difficult to determine, the confirmed breeding population and supporting habitat were recognised as locally important within the assessment. The potential for significant effects on this population was also clearly identified, with the unmitigated effect assessed as profoundly negative and permanent. The proposed mitigation measures therefore seek to maintain the local population and availability of suitable habitat through avoidance and protection where practicable, together with habitat management and enhancement measures.

2.4.3.1.2 Hydrological Connectivity and Peatland Habitats

Summary:

Concerns were raised regarding the presence of raised bog and cutover bog habitats within the Proposed Project site and their potential hydrological connectivity with the Little Brosna River, Sharavogue Bog SAC and the Shannon Callows SAC/SPA. Particular concern relates to the potential for peat excavation, drainage works and watercourse crossings to result in hydrological effects extending beyond the Proposed Project.

Response:

The concerns regarding hydrological connectivity and potential effects on nearby designated sites overlap with those raised previously by the Department and Offaly County Council. These matters, including potential groundwater and surface water connectivity with Sharavogue Bog SAC and indirect effects on raised bog habitat, have been addressed in detail in the preceding responses and read in conjunction with this response.

Potential effects associated with peat excavation, drainage and watercourse crossings were considered within the Hydrology and Hydrogeology Chapter of the EIAR and, where relevant to European sites, within the NIS. The assessment considered potential surface water and groundwater pathways between the proposed works and downstream or otherwise hydrologically connected receptors.

2.4.3.1.3 Implementation and Supervision of Ecological Mitigation

Summary:

The Planning Authority notes that implementation of the proposed mitigation measures will be overseen by relevant site personnel, including the Environmental Manager, ECoW, site supervisor and other appropriately qualified specialists, where required.

Response:

The Planning Authority's comments regarding the implementation and supervision of ecological mitigation are acknowledged. As outlined within the submitted EIAR and Appendix 2-3 CEMP, the implementation of mitigation measures will be overseen by appropriately qualified personnel, including the Environmental Manager and ECoW, with input from other relevant specialists where required.

2.4.3.2 Hen Harrier Survey Effort and Potential Roosting Use

Summary:

The Planning Authority had a similar observation to Offaly County Council, stating that no Hen Harrier surveys were undertaken during the 2022 breeding season and that winter roost surveys were only undertaken during the 2025/2026 survey season. On this basis, the Planning Authority considered that the potential use of the proposed wind farm site by roosting Hen Harriers cannot be fully excluded.

Response:

Please see the response to this submission in section 2.3.6.

2.4.3.3 Functional Importance of the Site for SPA-associated Waders

Summary:

The Planning Authority has a similar observation to Offaly County Councils, outlining that the assessment does not provide a sufficiently robust evaluation of the functional importance of habitats within the Proposed Project site in supporting SPA-associated wading bird species, particularly Golden Plover and Lapwing.

Response:

Please see the response to this submission in section 2.3.6.1.7.

2.4.3.4 Forestry, Vegetation Clearance and Breeding Birds

Summary:

The Planning Authority notes that approximately 7.2 ha of commercial forestry will require felling to facilitate the Proposed Project and that the necessary felling licence will be required. The submission also notes the proposed timing of vegetation clearance outside the bird breeding season and the requirement for ecological checks where minor clearance or trimming is required during this period.

Response:

The Planning Authority's comments regarding forestry felling and vegetation clearance are acknowledged. As outlined within the submitted EIAR, approximately 7.2 ha of forestry will be felled to facilitate the Proposed Project, with the appropriate felling licence obtained prior to these works where required.

With the exception of the identified commercial forestry felling and where specific timings around vegetation removal have been specified in the mitigation measures, vegetation clearance will be undertaken outside the main bird breeding season, where practicable. Where minor clearance or trimming is required during this period or in the aforementioned timing restrictions of species mitigation measures, works will be preceded by a pre-clearance survey undertaken by a suitably qualified ecologist to identify any breeding bird sensitivities and ensure that appropriate measures are implemented.

2.4.4 Conclusion

The Applicant respectfully submits that the issues raised by Tipperary County Council in this submission have been carefully considered and appropriately assessed in the EIAR, NIS and Planning Statement submitted with the application, as well as the additional responses provided herein. While the Planning Authority has identified matters relating to policy compliance, landscape and visual effects, grid infrastructure, biodiversity and hydrology, none of the issues raised demonstrate that the Proposed Project would give rise to unacceptable environmental effects that cannot be effectively avoided, mitigated or managed.

It is also noted that the Planning Authority does not recommend refusal of the project, but requests An Coimisiún Pleanála to engage fully with its acceptability having regard to the CDP and all other relevant planning policy and legislative requirements. The Applicant respectfully agrees that such full engagement is required.

The Applicant acknowledges that two turbines are located within an area identified as unsuitable for new wind energy development under the current Tipperary Renewable Energy Strategy and that this gives rise to a material contravention of the Tipperary County Development Plan 2022. However, the existence of a material contravention does not preclude the grant of permission. The Commission is expressly empowered under section 37G(6) of the Planning and Development Act 2000, as amended, to grant permission notwithstanding such a contravention where justified having regard to the particular circumstances of the development and all relevant planning considerations. In this regard, the Proposed Project must be considered in the context of evolving national, regional and local renewable energy policy, the

recognised need for substantial additional renewable electricity generation capacity, and the strategic importance of the development as a single integrated eleven-turbine wind farm.

The Applicant respectfully submits that the proposed Ballincor Wind Farm should be assessed on its individual merits having regard to the environmental assessments undertaken, the proposed mitigation measures, national renewable energy and climate policy objectives, and the strategic nature of this renewable energy development. In exercising its functions, the Commission is required to have regard to section 15 of the Climate Action and Low Carbon Development Act and the significant climate, energy security and renewable energy benefits arising from the Proposed Project.

Having regard to the overall planning balance, the strategic need for renewable energy infrastructure, the findings of the EIAR and NIS, and the mitigation measures proposed, the Applicant considers that there are compelling and sufficient grounds to justify the grant of permission for the Proposed Project. Accordingly, the Applicant respectfully requests that An Coimisiún Pleanála grant planning permission for Ballincor Wind Farm.

2.5 HSE

The applicant has considered the HSE submission and confirms all mitigations measures within the CEMP will be implemented in full. The mitigation measures noted by the HSE in the interest of public health, listed on page 13 of the submission, are agreeable to the applicant. Comments in relation to noise are addressed below.

2.5.1 Noise

The methodology adopted for the assessment of wind turbine noise in Chapter 11 of the EIAR is in accordance with the applicable guidelines set out in the Wind Energy Development Guidelines for Planning Authorities, 2006 (WEDG06).

The assessment is also supported by best practice guidance for the assessment of wind turbine noise, namely, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Turbine Noise (2013) and its supplementary Guidance Notes (2014) (IOA GPG). Full details of guidance documents referenced for the assessment of operational wind turbine noise are presented in Section 11.3.2.6.1 of the EIAR.

The Draft Revised Wind Energy Development Guidelines (2019) and the World Health Organisation (WHO) Environmental Noise Guidelines for the European Region (2018) were considered in the EIAR in the context of the noise impacts assessment and are addressed in Section 11.3.2.6.9 EIAR.

AWN is aware of, and has reviewed, the court judgment cited within the HSE submission (and other submissions). The content of these judgments does not alter the assessment presented in the submitted EIAR. It is confirmed that the most up to date applicable guidelines, best practice guidance and standards have been applied to the assessment of wind turbine noise in the EIAR.

The following statement is reiterated from Section 11.3.2.6.8 of the EIAR:

“The assessment of wind turbine noise presented in this EIAR is based on the guidance outlined in WEDG06 and has been supplemented with best practice guidance from ETSU-R-97 and the

IOA GPG. If updated Wind Energy Guidelines are published during the application process for the Proposed Project it is anticipated that any relevant changes affecting the noise will be addressed through an appropriate planning condition, or where a supplementary assessment is necessary, through provision of additional information.”

It is acknowledged that an update to ETSU-R-97, Assessment and Rating of Wind Turbine Noise, was published by the UK Department for Energy Security and Net Zero on 19 June 2026, following submission of the EIAR.

The updated guidance retains the core methodology of the original ETSU-R-97 for the assessment of noise from wind farm developments. Notwithstanding the updated UK Guidance, the references to ETSU-R-97 within Chapter 11 of the submitted EIAR remain applicable and consistent with current best practice guidance. Baseline noise data collected in accordance with the IOA GPG are unaffected and remain valid for the purposes of the assessment presented in the EIAR. The Guidelines (WEDG06) continue to apply as the noise criteria applicable at receptors for proposed wind farms in Ireland.

The assessment methodology, baseline noise surveys, data applicable turbine noise criteria, and the conclusions of the noise assessment presented in Chapter 11 of the EIAR remain valid and consistent with current best practice and applicable guidance.

2.5.2 Comments on the Change in Noise Level

The NEHS makes specific reference to British Standard BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS-4142) to demonstrate that ‘a change in noise level can have significant adverse effect and a magnitude of 10 dB would be considered significant’.

Statements from BS-4142, if considered in isolation, fail to account for the context in which the noise levels occur and the overall level of noise, which are critical factors in the assessment.

The BS-4142 standard includes the follow statement with respect to context:

“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.”

”The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”

As a point of clarification, BS-4142 is not applicable to the assessment of wind turbines, and this is acknowledged in the comments from the NEHS. This is confirmed in Section 1.3 of BS-4142 which contains the following statement:

'The standard is not intended to be applied to the rating and assessment of sound from: [among other factors] other sources falling within the scope of other standards or guidance.'

The statement from BS-4142 therefore confirms that the standard is not applicable for the assessment of wind turbine noise.

The assessment of wind turbine noise and associated impacts and effects fall within the scope of other standard and guidance as discussed in detail in Section 11.3.2.6.1 of the EIAR.

The following comments are contained in the submission by the HSE:

'In the opinion of the NEHS, tabulation of the predicted change in the noise environment from the proposed development and the cumulative change in the original baseline noise environment before any wind farm development in the area is the most informative way of reporting the likely effect of operational noise in an EIAR.'

Appendix 11-6 and 11-7 of the EIAR present the predicted turbine predictions at all NSLs in tabulated form.

The criteria for setting turbine noise limits is outlined in Section 11.3.2.6 of the EIAR. This requires that background noise levels in the receiving environment be determined and that appropriate turbine noise limits be defined relative to the baseline noise environment.

Section 11.4.2 of the EIAR confirms the derived background noise levels which have been measured at seven locations within the receiving environment. Section 11.5.2 of the EIAR discusses the applicable criteria and proposes operation noise limit for the wind turbines, which have been set with reference to the background noise environment at surrounding NSLs.

The likely significant effects of operational noise from the Proposed Project has been assessed in accordance with best practice guidance (IOA GPG) applicable guidelines (WEDG06) and EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2022).

Summary:

The National Environmental Health Service reviewed Chapter 14 of the EIAR and the Traffic Management Plan submitted with the planning application. It confirmed that it is satisfied that the Traffic Management Plan will provide adequate protection of public and environmental health, provided that all identified mitigation measures are implemented in full.

Response:

The Applicant welcomes the conclusion of the National Environmental Health Service. All traffic-management measures specified in the Traffic Management Plan included in Appendix 2-2 of the EIAR will be implemented during the construction phase. The Traffic Management Plan will be developed into a detailed construction-stage Traffic Management Plan by the appointed contractor, taking account of the requirements of the planning permission and in consultation with Offaly County Council, Tipperary County Council and An Garda Síochána, as appropriate.

2.6 TRANSPORT INFRASTRUCTURE IRELAND (TII)

The TII submission has been reviewed and the applicant is in agreement with the recommendations made. We have no further comment.

2.7 UISCE EIREANN

Uisce Eireann have included two recommendations within their submission. The applicant agrees with these recommendations.

2.8 IRISH AVIATION AUTHORITY (IAA)

Three recommendations were made by the IAA. In response, the applicant agrees with these recommendations.

2.9 DEPARTMENT OF DEFENCE

Two recommendations were made by the Department of Defence. In response, the applicant agrees with these recommendations.

3. THIRD PARTY SUBMISSIONS

Within the third-party submissions the concerns and themes have been reviewed and are addressed within the relevant sections herein. The sections herein have focused on the key points raised in this submission where we feel a response is warranted and may be helpful for ACP in making a determination on the application. Many of these themes in the submissions are also already addressed in Section 2 above.

3.1 SID CONSENTS PROCESS

A third-party observation has highlighted that the application has intentionally bypassed the local authority. Consent has been sought from An Coimisiún Pleanála (ACP) as the Proposed Project falls within the classes of development prescribed under planning legislation for Strategic Infrastructure Development (SID). The determination of the appropriate consenting authority is therefore a matter of statutory requirement and not one of applicant choice.

During the pre-application consultation process, An Coimisiún Pleanála considered the nature, scale and characteristics of the Proposed Project and, pursuant to the provisions of the Planning and Development Act 2000 (as amended), including sections 37A to 37G relating to Strategic Infrastructure Development, determined that the project constitutes SID. As a consequence, the application is required by law to be made directly to An Coimisiún Pleanála for determination. Accordingly, the submission of the application to ACP reflects compliance with the statutory planning process and the formal determination made during pre-application consultations, rather than any discretionary decision on the part of the applicant.

3.2 CONFLICT WITH OFFALY AND TIPPERARY COUNTY DEVELOPMENT PLANS

A number of third-party observations received in respect of the Ballincor Wind Farm identify its location within areas which the Offaly County Development Plan and Tipperary County Development Plan identify as unsuitable, or not deemed suitable, for new wind energy development.

As set out in the Planning Statement submitted with the application, the wind farm site is located within an area identified as "Not Deemed Suitable for Wind Energy Development" under the Offaly County Development Plan and within an "Area Unsuitable for New Wind Energy Development" under the Tipperary County Development Plan. It is therefore acknowledged that the proposed Ballincor Wind Farm may constitute a material contravention of the relevant County Development Plan.

We respectfully submit, however, that a material contravention is the starting point of this planning assessment rather than its conclusion. The issue for An Coimisiún Pleanála is not only whether the project accords with the wind-energy mapping contained in the County Development Plans, rather, in the context of an application for Strategic Infrastructure Development, the Commission is required to consider the Development Plans as part of the full statutory planning balance and to determine whether, having regard to all relevant considerations, the circumstances of this particular development justify the exercise of its statutory discretion to grant permission notwithstanding the material contravention.

It is therefore not that national climate policy automatically overrides the Development Plans, as some third-party observations have stated, nor is it that renewable energy development benefits from an automatic entitlement to planning permission. Instead it is the evolution of the current national climate and renewable-energy framework since the preparation of the relevant local wind-energy strategies, the substantial and quantifiable contribution that the proposed Ballincor Wind Farm would make towards those objectives, and the site-specific environmental assessments submitted with the application collectively that provide justification for the Commission to exercise its discretion in favour of the project.

3.3 COUNTY DEVELOPMENT PLAN POLICY

A number of submissions raise concerns relating to the policy context for renewable energy development in County Offaly and Tipperary. These issues are addressed in detail herein.

The proposed wind farm is located within the administrative boundaries of Offaly and Tipperary County Council and the siting of the Proposed Project.

A number of submissions suggest that wind energy should be developed offshore instead of onshore, or that greater emphasis should be placed on solar energy developments. These submissions imply that further onshore wind development is unnecessary or inappropriate in County Offaly and Tipperary. In response, it is important to clarify both the wider national policy context for renewable energy and the status of the relevant Development Plan provisions.

In the context of Ireland's energy transition, onshore wind remains a critical pillar, alongside offshore wind and solar in delivering the Climate Action Plan targets and Ireland's binding 2030 climate commitments. While Ireland has significant offshore wind potential, particularly along the Atlantic coast, the timeline for large-scale offshore deployment is lengthy due to complex consenting processes, substantial grid-infrastructure requirements, and high capital costs. Solar energy, though expanding rapidly, began from a very low baseline and still represents a modest share of Ireland's renewable electricity. As recently as 2023, solar provided just 4.4%¹⁸ of national renewable energy generation. By contrast, onshore wind is mature, cost-effective, and readily deployable technology capable of providing significant renewable capacity in the short to medium term.

Under the Climate Action Plan 2025, Ireland must deliver 9 GW of onshore wind, 8 GW of solar PV, and at least 5 GW of offshore wind by 2030. Achieving this balanced mix is critical for maintaining grid stability, meeting interim emissions-reduction milestones, and ensuring energy security on the path to net zero by 2050. Onshore wind also offers important regional benefits, including local investment, employment, and community benefit funds. Its generation profile complements solar production, delivering renewable electricity during darker, windier periods when solar output is low. Without continued onshore wind development during the offshore build-out phase, Ireland risks falling short of its legally binding 2030 targets and increasing reliance on fossil fuels.

The Israel-Iranian-US war which started on the 28th of February 2026 has exposed Ireland's vulnerability to external geopolitical risk and the overreliance on imported energy sources.

¹⁸ First-Look-Energy-Supply-and-Security-of-Supply.pdf

Energy is the life blood of economies and modern economies run on electricity and renewable energy. Energy is not just a technical resource but a fundamental driver of social stability, economic growth, and overall quality of life.

Ireland maintains strategic fuel reserves of 90 days of net oil import primarily through the state body National Oil Reserves Agency (NORA), which are designed strictly for emergency use—such as major global supply disruptions or geopolitical crises as being experienced at the moment in the Middle East. However, Ireland does not maintain strategic reserves of natural gas, making it very exposed and vulnerable in that area, as most gas is imported via pipelines from the UK.

The Middle East geopolitical crisis demonstrates the resource vulnerability and oil/gas reserves are not sustainable in the long-term. This situation reinforces the strategic importance of energy independence for Ireland and accelerating the diversification of energy sources and accelerating the transition to renewable energy for greater long-term security of energy supply.

3.4 STATUTORY CONTEXT

Section 37G(6), as applicable to this Strategic Infrastructure Development application, expressly provides the Commission with jurisdiction to grant permission for development notwithstanding that the development materially contravenes the relevant development plan. As explained in Section 5.1 of the Planning Statement, the provisions of the relevant Development Plans are matters to which the Commission must have regard, but they are not determinative of an SID application.

Accordingly, the third party observations received are correct insofar as they identify an inconsistency with the relevant wind-energy designations. It does not follow, however, that the existence of that inconsistency is itself sufficient to require a refusal of the project.

That distinction has assumed particular importance following the Supreme Court judgment in *Coolglass Wind Farm Limited v An Bord Pleanála* [2026] IESC 5.

The Supreme Court expressly rejected the proposition that section 15 of the Climate Action and Low Carbon Development Act 2015, as amended, gives rise to a general or strong presumption that renewable energy projects should receive permission. Section 15 requires consistency, insofar as practicable, with the specified national climate objectives, but the Court recognised that a range of planning outcomes may satisfy that obligation.

Of direct relevance to the present application, however, the Supreme Court also confirmed that the Commission's power to grant permission in material contravention of a development plan is itself a function to which section 15 applies. Critically, the Court held that where it is established that a development plan does not meet current climate objectives, no longer does so because those objectives have changed, or where particular features of the specific development engage that issue, the Commission must consider whether permission should nevertheless be granted and must be capable of explaining how its ultimate decision is consistent with the section 15 objectives.

The error identified by the Supreme Court in *Coolglass* was that the material contravention appeared effectively to have become a reason in itself for refusing permission, without real and

substantive engagement with the climate benefit of the development as a reason for exercising the statutory discretion to permit the project notwithstanding that contravention.

That principle is directly relevant to the third party observations now before the Commission. The existence of the Offaly and Tipperary wind-energy designations must therefore be given appropriate weight, but the planning exercise cannot end with those designations. The Commission is also required to examine the circumstances which underlie them, the contemporary national policy and statutory context, and the particular characteristics and effects of the Ballincor wind farm.

3.5 EVOLUTION OF POLICY

There has been a material evolution in the national legislative and policy framework governing climate action and renewable electricity since the preparation of the strategic evidence base underlying the relevant local wind-energy designations.

In the case of Tipperary, the Renewable Energy Strategy incorporated into the current County Development Plan originated in 2016. Tipperary County Council itself subsequently acknowledged that, given legislative changes since its adoption and the preparation of the Local Authority Climate Action Plan 2024–2029, the Renewable Energy Strategy would require review and updating.

That fact does not disapply Policy TWIND 4.14 or the applicable wind-energy map. Indeed, the Applicant expressly acknowledges that the Ballincor wind farm is a new wind energy proposal and does not fall within the limited repowering and extension circumstances contemplated by TWIND 4.14. It does, however, constitute relevant evidence when considering the question identified by the Supreme Court in *Coolglass*: whether an existing local spatial designation continues fully to reflect the climate objectives applicable when the Commission comes to perform its present statutory function.

There is a similar temporal consideration in relation to Offaly. The Planning Statement records that the County's stated 2027 wind-energy target of 466.3 MW was developed by reference to the Climate Action Plan 2019. National climate and renewable-energy policy has advanced substantially since that policy baseline.

Climate Action Plan 2025 now constitutes the Government's current climate-action roadmap, including the objective of meeting 80% of electricity demand from renewable sources by 2030. Government policy continues to identify the delivery of approximately 9 GW of onshore wind by 2030 as a necessary element of achieving that electricity-sector transition.

The scale of the delivery challenge remains material. SEAI's most recent published assessment records total installed wind capacity of approximately 5.10 GW at the end of 2025, noting that Ireland had already fallen approximately 0.9 GW short of the 6 GW wind-capacity milestone set for the end of 2025.

The Revised National Planning Framework further strengthens the spatial-planning dimension of this policy evolution. It introduces regional renewable-electricity capacity allocations specifically to facilitate accelerated delivery of onshore wind and solar generation and states

that regional strategies and local development plans are to be reviewed and updated to reflect those allocations.

The Applicant therefore does not invite the Commission to disregard local planning policy. Rather, it submits that the local wind-energy designations must be considered in the context of the current, rather than historic, statutory and national policy framework when the Commission exercises its section 37G(6) function.

3.6 FUTURE PLANNING APPLICATIONS

A submission raise concerns that the Proposed Project would preclude the submission of future planning applications for housing in the area immediately around the proposed wind farm. In response, it is important to note that a comprehensive planning search was undertaken for the project, covering a 10 km radius around the Proposed Project site and including all relevant planning applications lodged in the last 10 years. All extant permissions and all live planning applications identified within this search area and timeframe were fully incorporated into the EIAR assessments. It is not known where future planning applications will be made, but this should not be considered as a valid reason not to grant permission for the Proposed Project, given the current climate emergency, the national climate objective and the need to construct more renewable energy projects to achieve the binding 2030 target of 80% of electricity from renewable sources. Without a formal application, in line with best practice guidelines for environmental assessment as listed in Chapter 1 (Introduction) of the EIAR, the applicant submits that hypothetical future planning applications are not an appropriate factor in An Coimisiún Pleanála's assessment of the Proposed Project and cannot sterilise land from development. For the purposes of the cumulative assessment, proposed and existing developments were assessed. Planning within the 720 m is not precluded subject to compliance with planning conditions.

3.7 COMMUNITY ENGAGEMENT AND CONSULTATION

Several submissions raised concerns regarding the lack of or inadequate public consultation. Public consultation is detailed in EIAR Section 1.10.5 and a Community Engagement Report detailing the consultation process is included as EIAR Appendix 1-4. Please refer to the Community Engagement Report which summarises the community engagement process which took place from July 2023 to February 2026. Post planning submission, the designated Community Liaison Officer remains available on the ground as key points of contact should any queries arise.

In relation to why a public consultation clinic (held on the 4th February 2026) was selected over a town hall event it is because previous team experience has shown that these are more effective at fostering widespread participation and allowing everyone an opportunity to speak and get their concerns voiced with the applicant team members. Everyone that sought a meeting with the applicant at the public clinic was accommodated.

Regarding traffic, community engagement during the construction stage with local residents was also raised within submissions. During the construction phase, communication with local stakeholders will be maintained regarding planned construction activities and traffic

management measures. Advance notice will be provided where significant deliveries or temporary traffic management measures are required, ensuring that local residents and road users are informed of construction activities.

3.7.1 Devaluation of Property

Concerns were raised in several submissions regarding the potential devaluation of property as a result of the Proposed Project. Based on the relevant literature discussed in Chapter 5 (Population and Human Health) of the submitted EIAR, it is reasonable to conclude that neither the construction phase nor the operational phase of the Proposed Project will have any significant effect on local property values.

As detailed in Chapter 5 of the EIAR, presently, there is one Irish based study that has looked at the effect of wind farms on property values within the Irish context (Gillespie & McHale, 2023). This study concluded that there are “*no significant reduction in house prices beyond 1 km*” and that the effects seen within the 0-1 km radius were not persistent and were seen to diminish over the operational lifetime of the wind turbines.

Additionally, a study carried out by McKenna *et al.* (2025), which was referenced in the third party submission, analysed the impacts of wind energy through the review of over 400 scientific articles globally¹⁹. McKenna *et al.* (2025) stated that “*Although some studies show a decrease in property prices of at least 2%, more recent research shows either minor impacts with limited statistical significance or cases of positive impact on real estate prices, the local economy, and incomes.*”

3.7.2 Community Life

Concerns relating to community life, in particular the potential reduction in the local population as a result of the Proposed Project, were raised in multiple submissions. These concerns referred to potential relocation of the existing population away from the area, potential discouragement of future settlement in the area, and the potential subsequent disenrollment in local amenities (e.g. local national school).

Whilst these concerns are acknowledged, the Proposed Project has in fact the potential to bring significant positive benefits to local communities through the provision of a Community Benefit Fund (proposed in line with industry best practice, which is in accordance with the terms and conditions of the Government’s Renewable Electricity Support Scheme (RESS)). The Ballincor Wind Farm Community Benefit Fund proposal is set out in Appendix 1-4 Community Engagement Report of the submitted EIAR. Support from the Community Benefit Fund has the potential to make the local area attractive for people to move to, which may result in a marginal increase in local population numbers.

As described in Chapter 5 (Population and Human Health) of the EIAR, the establishment of a Community Benefit Fund will be a long-term positive contribution to the local community. The impact of the Community Benefit Fund is likely to enhance the local economy, with potential for substantial funding for local projects in support of relevant UN Sustainable Development Goals

¹⁹ <https://doi.org/10.1016/j.joule.2024.11.016>

(SDGs), clubs, charities and near neighbours, which will be invested in the local area. This aspect of the Proposed Project will have a positive long-term effect on the individuals living in the local community, including contributing to a positive effect on individuals' physical and psychological health through the development of community led projects and maximising the level of local involvement in terms of influencing how the funds are spent.

It is not anticipated that the Proposed Project will have a significant effect on population trends locally or in County Offaly /Tipperary. Considering the other projects in the area, it is also not anticipated that the Proposed Project will have a significant cumulative effect under the topic of population trends. There is a potential positive cumulative effect in terms of population trends in the event of increased investment in the area from the Community Benefit Fund.

3.7.3 Tourism

Several submissions raised concerns regarding potential impacts on tourism as a result of the Proposed Project. Concern was raised in relation to a glamping business and also in relation to recreational use of the Little Brosna river. As detailed in Chapter 5 (Population and Human Health) of the EIAR there are a number of relevant tourist attractions and public amenities in County Offaly and Tipperary and in the wider area surrounding the wind farm site (attractions have been noted within 10 km). The nearest visitor site identified is approximately 5 km away from the proposed wind farm. No existing designated tourist sites or walkways/trails were identified as intersecting with or within the wind farm application boundary.

With regards to construction phase effects, as outlined in Section 5.4.2.1.6 of the EIAR, intermittent and temporary traffic effects due to movement of vehicles, plant and machinery related to the Proposed Project, and the requirement for abnormal loads related to the delivery of the turbines to site, may impact local road traffic as a result of increased road traffic movements. Therefore, there is potential for effects to local and tourist road users in the area during these periods. However, as described in Chapter 5 (Population and Human Health) of the EIAR, these are not considered to be significant. No other direct effects on tourism activity are anticipated during the construction phase.

With regards to the operational phase, the proposed wind farm will be visible from a number of features in the area (as discussed in Chapter 12 (Landscape and Visual Impact Assessment) of the EIAR). However, as noted in Chapter 5 (Population and Human Health) of the EIAR, Fáilte Ireland surveyed tourists' perceptions in relation to wind farms in the Irish landscape in 2007 and 2012, and the results were positive, with approximately 80% of tourists considering the presence of wind farms to either have no impact or a positive impact on their sightseeing. In addition, when asked if further wind farm development in Ireland would influence their decision to holiday in Ireland again, over 70% of responses cited no impact or a positive impact on their return to Ireland. Similarly, the 2017 study carried out by BiGGAR Economics examined the link, if any, between onshore wind energy development and the sustainable tourism sector in Scotland and did not find a direct relationship between tourism and the wind energy sector in itself. However, it did conclude that the increase in wind farm development did not negatively impact employment in the sustainable tourism industry in Scotland (BiGGAR, 2017).

As such, the Proposed Project is not anticipated to have a significant impact on tourism in the local area or wider region.

3.7.4 Bee Keeping

A concern was raised in relation to effects on bee keeping.

Based on the available research, a wind farm located about 1 -4 km from your apiary is unlikely to have a significant negative effect on honey bee colonies. Studies that have specifically examined honey bees near wind turbines found little to no measurable impact on colony health, behaviour, navigation, or productivity²⁰. The study found no significant effects of wind turbines on honey bee colony development, queen performance, forager navigation, mortality, or colony behaviour under the conditions tested. While some habitats will be removed, measures included in the BEMP will mitigation and enhance the habitats within the wind farm site.

3.7.5 Aarhus Convention

Several submissions mention a potential breach of the Aarhus Convention. The Aarhus Convention protects a person's right to a healthy environment by guaranteeing three core rights: access to environmental information, participation in environmental decision-making, and access to justice. As noted in Chapter 1, Section 1.9.5 of the EIAR, community engagement regarding the project commenced >24 months before the application was submitted with the delivery of the first information leaflet and setting up of the project website. Please refer to the Community Engagement Report (EIAR Appendix 1-4) which summarises the community engagement process. During this timeframe, the public had access to environmental information on the project and the opportunity to contact the project Community Liaison Officer and applicant.

3.8 VALIDITY OF THE WIND ENERGY GUIDELINES 2006

Submissions have been made stating that the Wind Energy Guidelines 2006 is out of date and unfit for purpose. In response, the design of the proposed wind farm was prepared fully in accordance with the Wind Energy Guidelines 2006, which remain the operative planning guidelines. In addition, the following guideline documents have been consulted with respect to the wind farm design:

- DoHPLG, Draft Revised Wind Energy Development Guidelines (December 2019);
- Irish Wind Energy Association, Best Practice Guidelines for the Irish Wind Energy Industry 2012;
- Irish Wind Energy Association, Community Engagement Strategy March 2018; and
- European Commission, Guidance document on wind energy development and EU nature legislation (November 2020).

²⁰ Fourrier, J., Fontaine, O., Peter, M., Vallon, J., Allier, F., Basso, B., & Decourtye, A. (2023). *Is it safe for honey bee colonies to locate apiaries near wind turbines?* Entomologia Generalis, 43(4), 799-809.



The provisions set out in the Draft 2019 WEDGs have been considered in the design of the Proposed Project in terms of noise, shadow flicker, visual amenity setback, environmental assessment, consultation obligations, community dividend and grid connections. The application of the draft guidelines is discussed in more detail in individual chapters in the submitted EIAR.

3.8.1 Typographical Errors

A typographical error in the site notice, whereby the term “Lightening Masts” appeared instead of “Lightning Masts”, is acknowledged; however, this minor spelling mistake did not compromise the clarity or validity of the notice, nor did it impede public understanding of the proposed works or participation in the planning process. The site notice for a planning application must provide a brief description of the nature and extent of the development (regulation 18(1)(d) of the Planning and Development Regulations 2001 (as amended)). Even though this application was lodged under Section 37E, the site notice provided such a description. The minor typographical error did not impede public participation, as demonstrated by the significant number of observations received.

This clerical mislabelling does not alter the content of the drawings, misrepresent the scale of the development, or prejudice the assessment of the application, and corrected scale labels will be provided to the Commission if required.

3.9 CHARACTERISTICS OF THE BALLINCOR WIND FARM

The wind-energy designations contained in a County Development Plan operate at a strategic and county-wide scale. In Offaly, the Wind Energy Strategy states that areas not deemed suitable are generally considered unsuitable by reason of environmental, heritage and landscape constraints and housing density.

These are legitimate considerations at strategic plan-making level. However, the application now before the Commission contains substantially more detailed, site-specific information than is capable of being considered through a county-wide sieve-mapping exercise. It is therefore material to examine whether the generic constraints underpinning the broad designation manifest themselves at Ballincor to a degree that would justify refusal of the particular development proposed. The evidence submitted with this application demonstrates that they do not.

The site is predominantly composed of agricultural land, cutover peatland and forestry in a generally low-lying landscape, with the Little Brosna River defining its eastern boundary. Existing regional and local roads and farm tracks provide access through and around the area. The project has been designed iteratively in response to the environmental and planning constraints identified through the EIAR process rather than by imposing a predetermined turbine layout upon the site.

3.9.1.1 Landscape and Visual Effects

The landscape and visual assessment specifically evaluates the capacity of the receiving landscape to accommodate the Proposed Project. Siting and design considerations were

embedded iteratively into the scheme and, following that process, the assessment does not identify significant landscape or visual effects requiring additional project-specific mitigation beyond the embedded design and reinstatement measures.

This evidence is particularly relevant where landscape considerations comprise one of the generic grounds underlying the unsuitable-area designations. It allows the Commission to assess the actual landscape consequences of Ballincor rather than relying solely upon the strategic designation as a proxy for those consequences.

3.9.1.2 Residential Amenity, Setback and Noise

Housing density and residential amenity similarly require consideration by reference to the development actually proposed.

The layout provides a minimum turbine setback of 720 metres from residential properties, save for one involved landowner at 550 metres, and the application includes detailed assessment of noise, shadow flicker and visual effects.

Baseline monitoring and predictive modelling undertaken for the Noise and Vibration assessment conclude that predicted operational turbine noise will remain within the applicable Wind Energy Development Guidelines criteria. Construction and decommissioning noise is predicted to remain below relevant threshold values, while operational noise from the proposed substation and battery storage facility has also been assessed against the applicable criteria. No significant noise or vibration effect is identified.

Accordingly, the existence of housing within the wider area does not translate, on the evidence before the Commission, into an unacceptable residential-amenity effect from this particular layout.

3.9.1.3 Biodiversity and European Sites

The proximity of the Little Brosna River and Sharavogue Bog SAC has been treated as a significant design constraint from the outset and has been subject to detailed ecological assessment.

The application is accompanied by an Appropriate Assessment Screening Report and NIS. The assessment considers the Proposed Project alone and in combination with other relevant plans and projects, on whether it could have significant effects on a European site(s) in view of the sites' conservation objectives, and identifies design and mitigation measures to avoid significant effects, including best-practice construction methods and the measures specified in the NIS.

The EIAR and associated CEMP incorporate measures including buffer zones, clear-span crossings and horizontal directional drilling, together with a BEMP.

The Proposed Project therefore does not rely upon its climate benefits as justification for accepting otherwise unacceptable ecological consequences. The environmental effects have separately been identified, assessed and, where necessary, avoided or mitigated.

3.9.1.4 Water Environment and Flood Risk

Hydrological and hydrogeological assessment has also informed the development. The proposed drainage and construction methodology incorporates sediment control, sustainable

drainage measures and watercourse buffers. The assessment concludes that no significant residual hydrological or hydrogeological effects, including significant cumulative effects, are anticipated.

Flood risk has likewise been specifically assessed and addressed through project design. Following the identified measures, the assessment concludes that residual flood risk to the development will be minimal and that the Proposed Project will not increase flood risk elsewhere.

3.9.1.5 Archaeology and Cultural Heritage

The Applicant also recognises the archaeological potential of the landscape, particularly by reason of its relationship with the Little Brosna River. The Cultural Heritage assessment identifies the potential for subsurface archaeological remains and provides for licensed test trenching, archaeological monitoring and preservation by record or in situ where required. Effects upon the Ballincor demesne landscape and townland boundaries are assessed as slight, with specific monitoring and recording provisions also identified for the turbine-delivery and grid-connection infrastructure.

Again, the existence of a heritage constraint at strategic level has not been ignored; it has been investigated at project level and addressed through the design and mitigation strategy.

3.9.1.6 Positive Planning Characteristics of the Site and Project

The proposed wind farm site possesses characteristics positively suited to renewable-energy development.

Part of the development comprises cutover peatland, and the application identifies the renewable-energy use of such lands as contributing to their transition towards sustainable after-use.

The project also benefits from a defined grid-connection solution, including a 110 kV substation, together with battery energy storage infrastructure. These elements are important when considering the practical contribution that the project can make to the electricity system rather than viewing its installed generating capacity in isolation.

At between 61.6 MW and 77 MW, the Ballincor wind farm represents a significant renewable-energy project capable of supplying electricity equivalent to the annual requirements of approximately 36,690–45,860 households. The contribution is therefore identifiable and substantial; it is not an abstract invocation of climate policy in support of a development making only a negligible contribution to the relevant objectives.

The project furthermore engages positively with a number of objectives contained within the Development Plans themselves. The Offaly Plan seeks a reasonable balance between national renewable-energy policy and environmentally sustainable harnessing of the County's wind resource and supports renewable-energy production, grid reinforcement and renewable-energy integration. The Tipperary Plan similarly contains policies supportive in principle of renewable generation, rural renewable-energy investment and the reinforcement and adaptation of electricity infrastructure.

Those provisions do not remove the acknowledged conflict with the respective wind-energy spatial designations. They do demonstrate, however, that the planning balance is more nuanced than a conflict between a project that is wholly contrary to local planning policy on one side and national climate policy on the other.

3.9.2 Application of the Coolglass Principles

Against that background, the Applicant respectfully submits that the observations which rely upon the unsuitable-area designations as determinative do not address the full planning and legal exercise required of the Commission.

The circumstances identified by the Supreme Court in *Coolglass* are materially engaged in this application because:

1. the national statutory and climate-policy framework has materially evolved since the preparation of important elements of the evidence base underlying the local wind-energy strategies;
2. the Revised National Planning Framework now expressly provides for accelerated renewable-electricity delivery through regional capacity allocations and anticipates the consequent updating of regional and local planning policy;
3. Tipperary County Council itself has recognised the need to review and update its 2016 Renewable Energy Strategy in light of subsequent legislative and climate-policy developments;
4. national renewable-electricity deployment remains materially behind the trajectory required to achieve the 2030 objectives;
5. the Ballincor wind farm would make a meaningful and quantifiable contribution to the required additional onshore renewable-generation capacity; and
6. the particular environmental, landscape, heritage and residential-amenity considerations which underpin the strategic unsuitable-area designations have been subjected to detailed site-specific assessment and do not, on the conclusions of the submitted EIAR, NIS and associated technical assessments, give rise to effects of such significance as would independently require refusal of the project.

This is therefore not an argument that every renewable-energy project located within an unsuitable area should be permitted. Nor would a grant of permission for the Ballincor wind farm amount to a general disapplication of the Offaly or Tipperary Development Plans.

Rather, it would represent the exercise of the specific statutory discretion conferred upon the Commission in respect of a Strategic Infrastructure Development application, based upon the particular evidence relating to this site, this development and the contemporary statutory and policy context.

3.9.3 Conclusion

The Applicant acknowledges the concerns expressed by third parties regarding consistency with the Offaly and Tipperary County Development Plans and accepts that the applicable wind-

energy spatial designations are an important consideration to which substantial weight must be afforded.

However, the existence of the material contravention cannot properly be treated as determinative of the application without proceeding to the further assessment required under the statutory framework and explained by the Supreme Court in *Coolglass*.

The Commission is respectfully requested to consider, in a real and substantive manner, the significant climate and renewable-energy benefits of the Project as a positive consideration in determining whether to exercise its section 37G(6) discretion; to consider whether the strategic wind-energy designations, having regard to their underlying policy context and subsequent developments in national climate and spatial-planning policy, continue fully to reflect the climate objectives which apply when the present decision is being made; and to consider the particular characteristics of Ballincor and the extensive site-specific environmental evidence before it.

When that assessment is undertaken, the Applicant submits that the planning balance is materially different from one based solely upon the designation of the lands on a county-wide wind-energy strategy map.

The project would provide between 61.6 MW and 77 MW of additional renewable generating capacity together with associated grid and battery-storage infrastructure; would make a significant and tangible contribution towards national renewable-electricity and decarbonisation objectives; and has been designed following detailed assessment of landscape, residential amenity, biodiversity, European sites, water, flood risk, archaeology, traffic and other environmental considerations.

The Applicant therefore respectfully submits that there are compelling, project-specific planning and policy reasons for the Commission to exercise its statutory discretion to grant permission for the Project notwithstanding the acknowledged material contravention of the applicable Development Plans, subject always to the Commission being independently satisfied as to the proper planning and sustainable development of the area and the environmental acceptability of the Proposed Project.

3.10 DESIGN FLEXIBILITY

Several submissions highlighted the applicant's use of "Design Flexibility" (Section 37CC of the Planning and Development Act, 2000, as amended). These submissions noted that the developer is seeking "Design Flexibility" under Section 37CC to decide on the final turbine specifications after permission is granted. They contend that it is impossible for the Commission to carry out a robust Environmental Impact Assessment (EIA) when the "worst-case scenario" remains a moving target, leaving residents in the dark about the true impact on their properties.

In response, design flexibility has been sought from An Coimisiún Pleanála for the turbine ranges used by the project (see EIAR Chapter 1 (Introduction), Section 1.10.1 and ACP's design flexibility opinion in Appendix 1-3). The 11 no. wind turbines on site will have a maximum blade tip height range from 179.5 m and 180 m inclusive, a rotor diameter range from 149 m-163 m inclusive, and a hub height range from 98.5 m-105 m inclusive, and all associated foundations and hard-standing areas respective of each turbine.

The exact combination of tip height, rotor diameter and hub height will be dictated by the selection of the turbine make and model at turbine selection stage/pre-construction. The turbine models or variants will fit within the parameters assessed within the EIAR. All parameters within the design flexibility range for the project have been assessed within the EIAR.

Design flexibility has not been sought from An Coimisiún Pleanála for the project grid connection (see EIAR Chapter 1 (Introduction), Section 1.10.1 and ACP's design flexibility opinion in Appendix 1-3).

A single grid connection will be constructed for the Proposed Project. The GCR constructed will be subject to receiving a grid connection offer following EirGrid/ESBN post planning system studies.

Design flexibility, as described above and discussed with An Coimisiún Pleanála at our project design flexibility meetings (ACP case number –318666-24), was sought as these items cannot be confirmed prior to grant of planning. This is the purpose of Section 37CC (i.e. to facilitate the identification of details which are not confirmed at the application stage for large projects and to provide design parameters and associated assessment in respect of those). The provision of parameters, and the assessment of the likely significant effects of the various permutations within them allows ACP to undertake robust EIA and assess the full range of impacts, and reach a reasoned EIA conclusion. It is confirmed that all likely significant effects arising from the various arrangements provided by these parameters have been fully assessed in the EIAR.

3.11 GRID AND CAPACITY CONSTRAINTS

A submission raised concerns regarding the grid capacity as neighbouring wind farms are curtailed due to grid capacity. Concern was raised in relation to cumulative grid connections to the Clondallow Substation. EirGrid are responsible for planning, developing and operating the grid and where they see issues they are best placed to manage grid constraints. They are progressing projects, including new and upgraded infrastructure along with operational improvements, to add capacity. At the end of last year they received approval for the revenue allowance to proceed with a number of projects under CRU's Price Review 6 (PR6) which adds more grid capacity, and they can look for a higher revenue allowance if they need to carry out more projects beyond those already identified.

In terms of the proposed Ballincor Wind Farm project, it is proposed to connect to the 110kV Transmission System which has a much higher capacity and lower constraints in this area.

It is also of note that grid constraints should not be seen as an impediment to granting permission for windfarms since a critical mass of projects with consent is a key enabler for further grid investment (and that there are various strategies in respect of the latter being advanced at present).

A number of submissions relate to multiple GCRs and in particular the routing of the grid is similar to Carrig. As part of the design the grid route was assessed based on the assumed presence of the Carrig 38kV cable. For example it is proposed to utilise an off road section on the L-70152.

The co-location of the cable or coordination with Carrig will be considered where planning permission and sequencing of construction allows. However as both projects are in the planning system at present, the projects are assessed cumulative as a worst case scenario.

In relation to the Clondallow residents, it is not proposed to install cables within the L-70152 local road, thereby limiting disruption on the local road.

3.12 NOISE AND VIBRATION

Third party submissions that had comments or raised issues relating to noise and vibration are addressed here. The comments have been dealt with under several headings or themes below which cover the main topics raised in the observations.

3.12.1.1 Assessment Methodology

EIAR Section 11.2.4 describes in detail methodology adopted for the assessment of operational turbine noise. The methodology and calculation setting are in full accordance with best practice guidance. Section 11.4 describes in detail the methodology adopted for the assessment of operational turbine noise. The methodology and calculation setting are in full accordance with best practice guidance.

Submissions state that alternative calculation settings and assessment methodologies would result in higher predicted turbine noise levels and, consequently, exceedances of the applicable criteria. However, adopting these alternative approaches would represent a significant departure from the applicable guidance and established best-practice methodologies for assessing wind turbine noise in Ireland.

AWN is aware of, and has reviewed, the court judgments cited within the submission documents. The content of the judgments does not alter the assessment presented in Chapter 11 of the submitted EIAR. It is confirmed that the most up to date applicable guidelines, best practice guidance and standards have been applied to the assessment of wind turbine noise in the EIAR.

3.12.1.1.1 Cumulative Assessment

The operational wind turbine noise assessment has considered all relevant other existing proposed and permitted wind turbines and is discussed in the following section of the EIAR:

- Section 11.4.5.3
- Section 11.5.2
- Section 11.9.2

3.12.1.1.1.2 Noise Prediction settings for Valley Corrections

The response provided in Section 3.12.1.2.1.5 addresses this concern.

3.12.1.1.1.3 Scoping out and not Assessing Predicted Exceedances

The submission claims that exceedances predicted by the applicant's own model were scoped out rather than assessed.

The six properties, H060, H071, H081, H100, H209 and H281, were not excluded from the assessment. They were included in the cumulative noise model, and the predicted cumulative exceedances were reported in Table 11-21 and Appendix 11.6 of the EIAR.

As explained in Section 11.6.4.1, the predicted exceedances at these locations are dominated by the existing Lacka/Skehanagh Wind Farm, while the contribution from the proposed Ballincor Wind Farm is more than 10 dB below the applicable turbine (cumulative) noise limits.

This approach is consistent with the IOA GPG methodology discussed in Section 11.3.2.6.5. The EIAR therefore distinguishes between the existing cumulative noise environment and the additional effect attributable to Ballincor and concludes in Section 11.9.1 that the cumulative effect of the Proposed Project in combination with other wind farm developments is not significant.

Any compliance matters relating to another operational wind farm development are a separate matter and do not alter the methodology adopted for assessing the Proposed Project in Chapter 11 of the EIAR. The use of higher assumed noise emissions for the Lacka/Skehanagh turbines provides a conservative basis for assessing the cumulative effect of the Proposed Project.

3.12.1.1.4 Significance of Effects

The assessment of significance is addressed in Section 11.3.1 of the EIAR. The significance of the effect associated with noise and vibration of the Proposed Project is described throughout Chapter 11 of the submitted EIAR.

With respect to the operational turbine noise the significance of effects are described in Section 11.6.2.1.1.1 and Section 11.8.2.1 of the EIAR. The effects associated with wind turbine noise are described as Not Significant. The alternative significance ratings suggested in the submissions are derived from alternative assumptions and criteria which are not those adopted in Chapter 11 of the EIAR and are not consistent with the assessment approach set out in current guidance.

3.12.1.1.2 Time of Background Noise Surveys

Section 2.3.1 of the IOA GPG methodology covers the time of the surveys and states “*Background noise surveys may be carried out at any time of the year provided that seasonal effects leading to raised noise levels can be excluded by selection of measurement position or by exclusion of non-typical data during analysis.*”

Appendix 11-3 of the EIAR presents the details of the methodology and background noise survey undertaken for the assessment. There is no strong evidence presented within the submission that the background noise survey is unduly influence by seasonal variations, which as noted in the IOA GPG are typically more likely when a measurement position is close to a running watercourse which is a significant noise source.

As it stated in Section 2 of Appendix 11-3 “*The noise survey and subsequent data analysis was carried out in accordance with best practice following the guidance contained in the Institute of Acoustics publication A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (May 2013), (IOA GPG).*”

3.12.1.1.3 Comments on Health

The assessment of noise and vibration has been undertaken in accordance with the applicable guidelines (WEDG06) and best practice guidance and standards for construction, demolition and operational phases of the Proposed Project as described in Section 11.3.2 of the EIAR. The assessment of Residual Effects presented in Section 11.8 of the EIAR confirm that all elements of the Proposed Project will be within the appropriate threshold values and noise and vibration limits identified.

Any additional responses addressing health concerns related to noise and/or vibration are provided under separate headings within this document.

3.12.1.1.4 Amplitude Modulation

As explained in Section 11.3.2.6.12 of the EIAR, the occurrence, duration and conditions associated with amplitude modulation cannot be reliably predicted at the planning stage. The EIAR therefore provides for amplitude modulation to be investigated and managed during operation where a complaint indicates that it may be present.

The commitments for managing complaints relating to wind turbine noise are set out in Section 11.7.2.2. Section 11.7.3 confirms the Applicant's commitment to operational noise monitoring and the investigation of noise complaints in accordance with an agreed monitoring protocol.

Prior to commissioning, the Applicant will submit a Noise Compliance Monitoring Programme to the planning authority for written agreement. This will set out the methodology for noise measurements, procedures for recording results and the process for managing complaints relating to noise in accordance with current guidance and industry best practice. Appendix 11.9 of the EIAR provides a draft Protocol for Managing Complaints, including complaints relating to amplitude modulation and tonality.

3.12.1.1.5 Low Frequency Noise and Infrasound

Submissions claim that impacts from low frequency noise and infrasound were not considered or assessed in Chapter 11 the EIAR.

Section 11.3.2.6.10 of the EIAR presents a discussion on the evidence for low frequency noise and infrasound associated with the operation of wind turbines. The EIAR has considered the potential for low frequency noise and infrasound associated with wind turbine noise.

3.12.1.1.6 Noise Predictions for Noise Sensitive Location H054

A Submissions claims that the noise prediction results for Location H054 (Eircode ref: R42 AE77) are not provided in the EIAR.

Table 2 of Appendix 11.4 of the EIAR confirm Location H054 is included in the list of NSL and Appendix 11.6 provides the tabulated noise prediction results for all NSLs included Location H054.

3.12.1.2 Greater Birr Wind Action Group (GBWAG)

3.12.1.2.1 Review of Chapter 11 by Allegro Acoustics

The GBWAG submission included a report within the Appendix on Page 854 that was prepared by Allegro Acoustics. This report was titled *Planning Stage Environmental Impact Assessment Report (EIAR) Chapter 11 Review*. The author identifies six specific technical comments, which are reviewed and addressed in the following sections. There is no Comment 5 in the report; the six comments below retain the numbering used in the report.

3.12.1.2.1.1 Comment 1

“While it is acknowledged that the Derived Background Noise Levels lack data for wind speeds exceeding 9m/s, setting out the criteria for higher wind speeds same with 9m/s represents a safe approach. However, the assessment doesn’t provide predicted noise levels for wind speeds above 9m/s to show compliance with these criteria. If the cut-off wind speed for the proposed wind turbines is 9m/s, or if the sound power levels remain constant for wind speeds above 9 m/s as implied in Figure 3, the current assessment would be considered adequate. However, indicative technical data publicly available for the Nordex N163 turbine series suggests that cut-out wind speeds can reach up to 26 m/s (<https://www.nordexonline.com/en/product/n163-5-x/>). Therefore, we ask the applicant to confirm that the maximum sound power levels resented in the EIAR, and utilized in the noise model, will not be exceeded under any operational circumstances at higher wind speeds. We suggest that these maximum sound power levels be defined within a Planning Condition to ensure that the predicted noise levels at 9m/s remain representative for higher wind speeds. i.e. The maximum permitted sound power level from each individual turbine at all wind speeds must not exceed the values included in the EIAR and shown below.

AWN Response:

As explained in Section 11.3.2.6.3 of the EIAR, the IOA GPG requires background noise surveys to cover the range from turbine cut-in wind speeds to the wind speed at which the proposed turbines generate their highest sound power output. Figure 11-3 in Section 11.4.5.2.1 shows that the candidate turbines reach their maximum sound power output at a standardised 10 m wind speed of 7 m/s. Background noise levels were derived up to at least 8 m/s at all monitoring locations and up to 9 m/s at some locations, as presented in Table 11-10 of the EIAR. It is confirmed that the background noise survey therefore covered the required wind-speed range.

It is explained in Section 11.5.1.1 of the EIAR that for higher wind speeds at which data points are not measured, the background noise curves and associated limits were capped in accordance with the guidance in paragraph 2.9.1 of IOA GPG Supplementary Guidance Note 2. The cut-out wind speed quoted for the Nordex turbine as noted in the submission is separate from the wind speed at which the turbines reach maximum sound power output. Although the turbine will operate above 9 m/s, Table 11-18 confirms that the sound power levels used in the assessment remain constant at higher wind speeds. It is confirmed that the sound power levels used in the EIAR noise model represent the maximum levels for the candidate turbines and will not be exceeded during operation at higher wind speeds.

Regarding the suggested planning condition for noise propose in the submission please refer to AWN response to Comment 2 in Section 3.12.1.2.1.2.

3.12.1.2.1.2 Comment 2

If the turbine model, size or type changes throughout the project, the sound power level from the turbine must not exceed the values included in the EIAR and shown in Table 2.

Maximum Permitted Sound Power Level (dB L _{WA})								
Octave Band Frequency (Hz)								dB L _{WA}
63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
88.6	96.2	98.3	99.5	101.3	102.0	96.4	82.0	107.4

Table 2: Maximum Permitted Sound Power Level (dB L_{WA}) per Octave Band.

AWN Response:

Specifying maximum permitted turbine sound power levels is not considered a best-practice approach for an enforceable planning condition intended to protect residential amenity. AWN respectfully requests that An Coimisiún Pleanála control operational noise from the Proposed Project through a planning condition setting turbine noise limits at noise-sensitive locations. This is the established best-practice approach and allows compliance to be assessed using a standardised methodology.

The proposed operational noise limits and their application to cumulative wind turbine noise are set out in Section 11.5.2 of the EIAR, with the basis for the criteria described in Section 11.3.2.6.1. Section 11.7.3 confirms the Applicant's commitment to managing operational noise and demonstrating compliance with any noise conditions applied to the Proposed Project.

3.12.1.2.1.3 Comment 3

"For low noise environments where background noise is less than 30 dBA WEDG06 recommends a daytime noise criteria of 35-40 dBA. The applicant has recommended the upper limit of 40 dBA be applied. Considering that the measured background day time noise level is as low as 23.9 dB at low windspeeds, it may be worth applying a criteria that is at the lower end of this threshold (35 dBA) for wind speeds that result in a background noise level that is significantly below the 30 dBA threshold."

AWN Response:

The proposed daytime lower threshold of 40 dB L_{A90} is within the 35 to 40 dB range recommended within the WEDG06 for quiet daytime environments and is consistent with established best-practice guidance and planning conditions applied to similar wind farm developments. The selection of the appropriate threshold, including consideration of the measured background noise levels and relevant guidance, is fully explained in Section 11.5.2 of the EIAR. AWN therefore considers that the proposed 40 dB L_{A90} criterion provides an appropriate level of protection for residential amenity. A lower criterion of 35 dB L_{A90} is not considered appropriate or necessary in this case.

3.12.1.2.1.4 Comment 4

“It is noted that the night time criteria defined by the applicant is above the daytime criteria for the locations where the derived background noise levels are below 30dBA. While this is in line with the wording of the WEDG06 guidelines it is important to note these are very low noise areas with existing noise levels as low as 18.8 dBA measured during nighttime hours at low wind speeds. As such applying a fixed noise limit of 43 dBA would result in noise levels that are significantly above the existing background nighttime noise level. We propose that in order to adequately protect the existing residents that the planning authority consider applying a lower nighttime noise limit than the 43 dBA fixed limit in cases where the existing background nighttime noise level is extremely low.”

AWN Response:

Background noise levels of approximately 18 to 22 dB L_{A90} were measured at standardised 10 m wind speeds of 3 to 4 m/s during night-time periods. The night-time turbine noise criteria were derived in accordance with the applicable guidance, as explained in Section 11.3.2.6 of the EIAR.

At these wind speeds, the candidate turbines operate at sound power levels below their maximum values. As shown in Table 11-18 and Figure 11-3 of the EIAR, the sound power levels of the N149 and N163 turbines are more than 10 dB below their respective maximum sound power levels, while the corresponding reduction for the V150 turbine is approximately 8 to 10 dB. The fixed lower night-time criterion of 43 dB L_{A90} therefore does not mean that turbine noise levels of 43 dB L_{A90} would occur at receptors under the wind-speed conditions associated with the measured background noise levels. Appendix 11.6 assesses the predicted turbine noise levels at each wind speed against the applicable criterion.

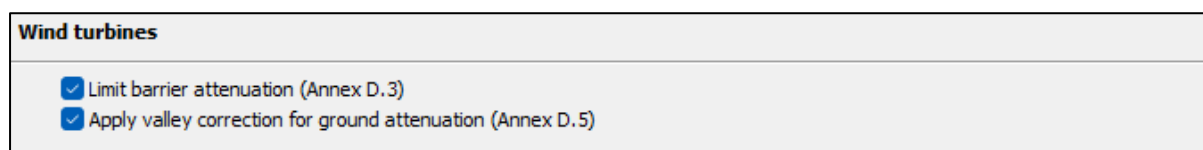
3.12.1.2.1.5 Comment 6

“We ask the applicant to submit further calculations and assessment to determine whether this topographical correction [valley correction] applies to the site, and if so, incorporate it into the predicted noise levels for the relevant noise sensitive locations and reassess the exceedance levels.”

AWN Response:

Appendix 11.4 of the EIAR confirms that OSI ground topography data were included in the noise model to account for propagation effects. It also states that barrier and ground corrections were applied in accordance with Sections D.3 and D.4 of Annex D to ISO 9613-2:2024. The reference to Section D.4 is a typographical error and should read Section D.5, which specifically provides the correction for ground attenuation over concave ground profiles, including propagation across valleys. The relevant valley correction was enabled in the noise prediction software, as shown in Figure 3-1.

Figure 3-1 Snip of Model Setting from DGMR iNoise Enterprise (Version 2024.3)



As part of the noise impact assessment Awn assessed wind turbine noise using both ISO 9613-2:1996 with the IOA Good Practice Guide parameters and ISO 9613-2:2024 with the Annex D parameters. No significant differences were identified in the assessment results or conclusions. It is therefore confirmed that relevant valley propagation effects were included in the assessment presented in Chapter 11 and Appendix 11.4 of the EIAR. No further calculations or reassessment are necessary.

3.12.1.2.1.6 Comment 7

"We ask the applicant to explain why the above (include below) mentioned noise sensitive locations were excluded from the assessment."

Noise Prediction Results for some of the Noise Sensitive Locations (H040, H055, H082, H128, H182, H207, H214, H220, H234, H235, H247, H269, H285, H290, H291, H295, H305, H308, H310, H311) were not included in the results table in Appendix 11.6."

AWN Response:

It is confirmed that there are no noise-sensitive locations identified in the assessment with the reference numbers H040, H055, H082, H128, H182, H207, H214, H220, H234, H235, H247, H269, H285, H290, H291, H295, H305, H308, H310 or H311. The list of noise-sensitive locations presented in Table 2 of Appendix 11.6 is complete and accurate.

The properties specifically referenced in the submission are all commercial properties and do not meet the definition of a noise-sensitive location applied in the assessment. The WEDG06 defines a residential noise-sensitive location as an "occupied dwelling house".

3.12.1.2.1.7A pattern of permissive choices that leaves no margin for error.

Section 7.3 of the submission alleges that the turbine noise assessment presented in the EIAR consistently adopted the least conservative options available, resulting in an assessment with no margin for error or omitted corrections.

AWN Response:

The response provided in Section 3.12.1.2 covers the concerns raised by the observer.

3.12.1.2.1.8 Failure to Assess Valley Propagation Effects in Accordance with Industry Guidance

Section 7.3 and 7.4.1 of the submission alleges that the turbine noise assessment in the EIAR omitted the valley correction required by the IOA GPG. It claims that applying the correction would change the assessment conclusions and result in predicted night-time exceedances at 11 residential properties.

AWN Response:

The response provided in Section 3.12.1.2.1.5 addresses this concern.

3.12.1.2.1.9 The background survey is built on data the instruments could not reliably measure

Section 7.4.2 of the submission claims that the instrumentation was not appropriate for the background noise survey and that its noise floor affected the data used to derive the turbine noise limits.

AWN Response:

Section 2 of Appendix 11.3 confirms that the noise survey and data analysis were undertaken in accordance with the IOA Good Practice Guide. It also confirms that each Rion NL-52 sound level meter was fitted with a Rion WS-15 outdoor microphone protection system compliant with Section 2.4.1 of the guidance.

The Rion NL-52 meets the Class 1 requirements of IEC 61672-1 and is suitable for precision environmental noise measurement. The survey instrumentation therefore meets the requirements of Section 2.4 of the IOA Good Practice Guide including all recommended calibration procedures. The manufacturer states that the inherent noise floor is typically below 17 dB(A) which is consistent with the data measured as part of the noise survey presented in the EIAR.

3.12.1.2.1.10 Consistency with the Offaly County Development Plan (DMS-109) is not demonstrated

Section 7.2.6 and 7.4 of the submission claims that the EIAR does not demonstrate compliance with DMS-109 of the Offaly County Development Plan, as it does not assess turbine noise against the WHO 2018 guidelines.

AWN Response:

The Offaly County Development Plan policy DMS-109 is not referenced in Chapter 11 of the EIAR. DMS-109 states that, when assessing planning applications for wind energy developments, the Council will have regard to the Wind Energy Development Guidelines for Planning Authorities and any subsequent amendments.

DMS-109 also states that the Council will consider potential effects on human health, including noise disturbance and consistency with the World Health Organization's 2018 Environmental Noise Guidelines for the European Region, as well as shadow flicker and air quality.

The wind turbine noise assessment was undertaken in accordance with the Wind Energy Development Guidelines for Planning Authorities, as detailed in Section 11.3.2.6 of the EIAR. The WHO 2018 guidelines were also considered and are addressed in Section 11.3.2.6.9. Therefore, although DMS-109 was not expressly referenced, the noise matters identified within it were considered in Chapter 11 of the EIAR.

3.12.1.2.1.11 The propagation model is applied outside its validated range, in the direction of under-prediction

Section 7.4.3 of the submission claims that the ISO 9613-2 propagation model was applied outside its validated range and that the calculation settings used in the EIAR result in under-prediction of turbine noise.

AWN Response:

The prediction model, calculation standard and settings applied are described in Section 11.4.5 and Appendix 11.4 of the EIAR. These are appropriate for the planning-stage assessment and are in accordance with established best-practice guidance for the assessment of wind turbine noise.

The claim that the noise model was applied outside its validated range is misleading. ISO 9613-2:2024 supports its application to elevated sources, including wind turbines. Annex D.

The stated estimated accuracy for distances given in Table 4 of ISO 9613-2 are up to ± 3 dB, this does not indicate a bias towards under-prediction or over prediction.

While Table 4 of ISO 9613-2 standard does not provide an estimated accuracy for distances beyond 1,000 m, this does not mean that the method is invalid or under-predicting at those distances. Section D.7, Annex D of ISO 9613-2 states “*Investigations and comparisons of calculated and measured sound pressure levels from wind turbines have shown that with the additional recommendations described in this annex, neither the wind speed range of Clause 5 nor the height range of Table 4 represent a restriction nor limitation on the applicability of this document to wind turbines*”.

Additionally, Section D.1, Annex D of ISO 9613-2 states “*This annex focuses on land-based and near-shore wind turbines. Many years of experience in comparing the measured sound pressure levels with those calculated with this document (see References [20] to [26]) have shown that with the following recommended parameters, reasonable agreement between measured and calculated results are realized, with predictions being similar to or above measured levels depending on the parameters used (receiver height, source levels etc.)*”

3.12.1.2.1.12 Cumulative night-time exceedances predicted by the applicant's own model were scoped out, not assessed

Section 7.4.5 of the submission claims that predicted cumulative night-time exceedances at six properties were incorrectly scoped out rather than assessed. It argues that Ballincor would add to an existing noise environment that already exceeds the applicable limit.

AWN Response:

The response provided in Section 3.12.1.1.1.3 covers the concerns raised by the observers.

3.12.1.2.1.13 Internal inconsistencies leave the predictions unreliable on their own terms

Section 7.4.4 of the submission claims that uncertainty was applied inconsistently in the turbine noise assessment, both to present the predictions as conservative and to discount near-limit results.

AWN Response:

The assertion in the submissions that uncertainty was applied in contradictory directions is incorrect. As set out in Section 11.4.5.2, a +2 dB uncertainty correction was applied to the turbine sound power levels in accordance with the IOA GPG, providing a conservative and robust planning-stage assessment.

The discussion of measurement and calculation uncertainty in Section 11.6.4.1 does not remove or discount the predicted 0.2 dB exceedance at H010, predicted for the turbine with the highest noise emissions, the N163. Although the exceedance is small, it was treated as potentially significant and mitigation was specified in Section 11.7.2.1 to ensure compliance.

Measurement uncertainty is relevant at the separate post-completion compliance stage, when measured data will be assessed in accordance with the IOA GPG as set out in Section 11.7.3.1. The assessment therefore accounts for prediction uncertainty conservatively at the planning stage and applies the recognised measurement methodology separately when operational compliance is assessed.

3.12.1.2.1.14 Specific monitoring locations setting the most critical limits are the least reliable

Section 7.4.2.1, 7.4.2.2 and 7.4.6 of the submission claims that the background noise data used to establish the turbine noise limits are unreliable due to concerns regarding the regression analysis, data filtering and relocation of monitoring equipment.

AWN Response:

As described in Appendix 11.3 of the EIAR, seven locations were used for background noise monitoring. These were geographically distributed around the proposed wind farm site and located in rural environments representative of typical noise-sensitive locations within the receiving environment. The locations were selected based on professional judgement, site inspections and on-site observations, in accordance with the IOA Good Practice Guide and its Supplementary Guidance Notes.

A review of the measured data did not identify any unusual or atypical noise characteristics. The monitoring locations are therefore considered representative of typical rural background noise levels.

Section 3.1.2 of Appendix 11.3 describes the methodology used to remove the potential contribution from existing wind turbines. The approach is transparent and consistent with the IOA Good Practice Guide. The background noise assessment is therefore considered robust and in accordance with best-practice guidance.

3.12.1.2.1.15 Amplitude modulation, low-frequency noise, monitoring and mitigation are inadequately addressed

Section 7.4.7 and 7.4.8 of the submission claims that amplitude modulation, low-frequency noise, operational monitoring and mitigation are not adequately addressed in the EIAR. It also questions the proposed curtailment measures and the absence of a final Noise Compliance Monitoring Programme.

AWN Response:

The response provided in Section 3.12.1.1.4 and 3.12.1.1.5 covers the concerns raised by the observer.

3.12.1.2.1.16 Low Frequency Noise and Infrasound

Section 11.1.7.5.6 of the EIAR presents a discussion on the evidence for low frequency noise and infrasound associated with the operation of wind turbines. The EIAR confirmed that ‘low frequency noise and infrasound associated with wind turbines is expected to be below perceptibility thresholds and are not likely to result in any significant effects at NSLs.’ The EIAR has considered the potential for low frequency noise and infrasound associated with wind turbine noise.

3.12.1.2.1.17 Health Impacts (Noise and Vibration)

The assessment of noise and vibration has been undertaken in accordance with the applicable guidelines (2006 WEDGs) and best practice guidance and standards for construction, demolition and operational phases of the Proposed Project as described in Section 11.1.7 of the EIAR. The assessment of potential effects presented in Section 11.4 of the EIAR confirm that all elements of the Proposed Project will be within the appropriate threshold values and noise and vibration limits identified.

Any additional responses addressing health concerns related to noise and/or vibration are provided under separate headings within this document.

3.13 POPULATION AND HUMAN HEALTH

Several submissions raised concerns surrounding general health effects to the population as a result of the Proposed Project, and wind energy in general.

As highlighted in Section 5.4.3 of EIAR Chapter 5 (Population and Human Health), the health assessment conducted as part of the EIAR concluded that for the construction phase of the Proposed Project, there will be no likely significant effects. Section 5.4.3 of the submitted EIAR also assessed the potential human health effects that may occur during the operational phase. The following areas were assessed:

- Air quality and Dust;
- Noise and Vibration;
- Water Quality;
- Land and Soil;
- Traffic; and
- Wind Turbine Health Effects (including noise and infrasound, electromagnetic interference, and shadow flicker).

It was concluded for each of these items that no likely significant adverse human health effects will occur as a result of the Proposed Project following the implementation of the proposed mitigation measures. Furthermore, the contribution of the Proposed Project to a decrease in reliance on fossil fuel combustion will have a moderate positive long-term effect on the health and well-being of the general population.

Section 5.3.3.4 of Chapter 5 (Population and Human Health) of the EIAR provided an overview of relevant research, including a review of studies from Australia, Canada, the UK and other European countries. The research found that wind farms have no associated direct pathological effects on human health, and that any potential impact can be minimised by following planning

guidelines. Notable studies discussed in Chapter 5 (Population and Human Health) of the EIAR include a 2014 meta study by Knopper *et al*, in 2014 and a study by Health Canada in 2014 which both found no links between wind farms and numerous health conditions. In addition to the above, a longitudinal study in Germany by Krekel *et al*. in 2025 found no evidence of negative effects on general, mental, or physical health, nor on doctor visits or suicide rates, in populations living near wind turbines²¹. As outlined in Section 5.6.2 of Chapter 5 (Population and Human Health) of the EIAR, based on the literature reviewed, there is currently no reliable evidence to link wind turbines to adverse health impacts.

Additionally, as outlined in Chapter 5 (Population and Human Health) of the EIAR, no health agency has concluded that exposure to Electromagnetic fields (EMF) from power lines and other electrical sources is a cause of any long-term adverse effects on human, plant or animal health.

3.13.1.1 Vulnerable groups

Several submissions raised concerns specifically relating to health effects of vulnerable groups, and the omission of specific individual receptors within the human health assessment. As outlined in Chapter 5 (Population and Human Health) of the EIAR, every community will have vulnerable individuals, however, the health status of the community can only be established to a certain level (i.e., small area statistics). It is not possible or necessary to identify every vulnerable individual.

As described in Chapter 5 (Population and Human Health) of the EIAR, it is important to note that the Health Standards are set for the vulnerable and not for the robust. Emission limits and management, such as for noise or dust, allow for the protection of the most vulnerable, so as long as the limits are met, vulnerable individuals and the wider community are protected. Emissions arising from the operational phase of the Proposed Project (i.e., air, dust, noise and vibration) are predicted to fall below the limits and/or thresholds set, therefore it is anticipated that significant adverse effects on health, even amongst the vulnerable, are unlikely.

Several submissions raised concerns surrounding the potential for shadow flicker to adversely affect the health of vulnerable individuals, including those with epilepsy. As described in Chapter 5 (Population and Human Health) of the EIAR, the UK Wind Energy Guidance Note, prepared in the UK for the Renewables Advisory Board and Department for Business, Enterprise and Regulatory Reform (BERR) in 2007, addressed the question whether the shadow flicker from wind turbines can cause effects on human health. It was found that the frequency at which photosensitive epilepsy may be triggered generally is between 2.5 and 30 flashes per second (hertz). Most commercial wind turbines rotate at between 0.3 and 1.0 hertz, giving health effects arising from shadow flicker little potential to occur. The Proposed Project has committed to a near-zero shadow flicker (see EIAR Chapter 16 (Shadow Flicker)) which will eliminate that potential effect from dwellings in the surrounding areas through the use of screening measures and turbine control mechanisms.

²¹ <https://cep.lse.ac.uk/pubs/download/dp1950.pdf>

3.13.1.2 Noise and Health

A number of submissions refer to potential impacts as a result of noise emissions during the construction and operational phases of the Proposed Project.

As described in Chapter 5 (Population and Human Health) of the EIAR, in general, the distances between the construction activities associated with the Proposed Project and the nearest noise sensitive locations (NSL's) are such that there will be no significant noise and vibration effects at NSL's. There will be works required at the proposed turbine delivery route (TDR) works areas and along the route of the proposed GCR during the construction phase, however, these will be short-term in nature and they will not result in significant noise and vibration effects.

With regards to the operational phase, the distances between the proposed wind farm infrastructure and the nearest property receptors are such that significant noise and vibration effects at these receptors are unlikely. Furthermore, based on the outcomes of the wind turbine noise assessment undertaken in Chapter 11 (Noise and Vibration) of the EIAR, the predicted noise levels associated with operational wind turbines at the proposed wind farm will be within best practice noise criteria. Chapter 11 (Noise and Vibration) of the EIAR states that low frequency noise and infrasound associated with wind turbines is expected to be below perceptibility thresholds and are not likely to result in any significant effects at NSLs. There are no criteria proposed to assess low frequency noise or infrasound as part of the EIAR.

As such, it is predicted that wind turbine noise associated with the Proposed Project will be not significant. It is therefore concluded that human health effects cited as an outcome of wind turbine noise and infrasound (such as nausea, disturbance of sleep, and tinnitus) generated during the operational phase of the proposed wind farm is unlikely. The referenced publications and studies outlined within Chapter 5 (Population and Human Health) of the EIAR indicate that there is little scientific evidence of the effects of "Wind Turbine Syndrome" effects. The studies show that wind farms are not a significant source of noise and infrasound, and that traffic and everyday human activity are likely to be more relevant.

With regards to vulnerable people, emission limits, including for noise, are set to protect the most vulnerable in a community rather than the robust. Compliance with the limits set out in best practice guidelines (detailed in EIAR Chapter 11 - Noise and Vibration) will ensure that individuals and communities are protected. Mitigation measures detailed in EIAR Chapter 11 (Noise and Vibration) will be put in place to ensure that the emissions and effects from the Proposed Project are in compliance with the standards to ensure that there will be no significant adverse effects on health, even amongst the most vulnerable.

3.13.1.3 Services

A number of submissions were made in relation to the water supply and electricity at Sharavogue Crossroads. There is no proposed derogation in water or electric supply at this location.

3.13.2 UN Convention on the Rights of the Child (UNCRC)

A submission suggests that the proposed wind farm raises significant concerns in relation to Ireland's obligations under the UN Convention on the Rights of the Child (UNCRC). The main

concerns noted are the scale and siting of the development, including large turbines in close proximity to family homes, meaning that foreseeable impacts on children's health, wellbeing, and daily living environment have not been adequately addressed, contrary to Article 3 of the UNCRC, which requires that the best interests of the child be a primary consideration in all decisions affecting them. Article 24 further obliges the State to protect children's right to the highest attainable standard of health, including by preventing environmental harm; unresolved issues relating to noise, visual dominance, and impacts on mental wellbeing indicate a failure to properly assess child-specific health and developmental risks. In addition, Article 12 of the UNCRC requires that children have the right to be heard in matters affecting their lives, yet there is no clear evidence that children in the affected communities were meaningfully consulted or that their views were considered within the planning and environmental assessment process.

In response, the scale and siting of turbines in relation to residential developments is addressed in Section 3.25 of this response document. Health, Noise and Landscape and Visual impacts are assessed within the relevant chapters of the EIAR. Further responses to concerns around these specific topics are included within this report. In terms of community engagement, this is discussed in EIAR Section 1.10.1 and a Community Engagement Report was presented as Appendix 1-4. It is further explained herein within Section 3.7. There was no age limit on consultees participating in the consultation process.

3.14 ANIMAL HEALTH

Several submissions raised concerns relating to the potential health impacts on their domesticated animals and livestock. In response we note that the lands adjacent to and surrounding many wind farms across the country are utilised by animals. There is no scientific evidence that wind turbines have a negative impact on domesticated animals or farm animals grazing in close proximity. Wind farms and livestock farming frequently coexist, with cattle grazing safely around turbine bases. Additionally, as outlined in Chapter 5 (Population and Human Health) of the EIAR, no health agency has concluded that exposure to Electromagnetic fields (EMF) from power lines and other electrical sources is a cause of any long-term adverse effects on human, plant or animal health.

The Proposed Project will adhere to all applicable animal welfare and environmental protection standards, and the applicant remains committed to ongoing engagement with local farmers and stakeholders to address any concerns.

Wake effects describe the situation where one wind farm reduces the wind speed (and hence energy production) of a second wind farm. In designing the proposed Ballincor Wind Farm layout, wake effects from proposed turbines and from existing neighbouring turbines were considered.

This submission has queried the wake effects in relation to livestock. Livestock, including cattle, are generally considered safe around wind turbines and frequently use them for shelter. Livestock in Ireland have been grazing, and raising their young around wind turbines for over two decades without issue.²² The lands surrounding the proposed Ballincor Wind Farm will

²² <https://www.agriland.ie/farming-news/livestock-perfectly-happy-and-safe-around-wind-turbines-iwea/>

continue to be used by grazing cattle (should the landowners wish). In terms of horses, potential impacts are more likely to be related to noise, shadow flicker and visual rather than wake effects. The British Horse Society (BHS) recommends a minimum separation distance of 200 m or three times the turbine blade tip height (whichever is greater) between a wind turbine and any route used by horses or businesses with horses. The nearest stud to the proposed wind farm is located approximately 1.3 km east.

3.14.1 *Electromagnetic Interference*

Concern regarding electromagnetic interference and potential health implications was mentioned in a few submissions.

Electromagnetic Fields (EMF) together with optical radiation, which includes infrared (IR), visible light (and laser), and ultraviolet radiation, collectively make up the non-ionising radiation (NIR) spectrum. This type of radiation does not have enough energy to break up (ionise) atoms or molecules. It is therefore different to ionising radiation such as X-rays or radioactive substances, that can break up molecules and is known to cause damage to human cells.

EMF are generated by everyday items such as mobile phones and electrical appliances. EMF are intentionally produced and used to transmit information or to heat things such as food. So, we use EMF every time we listen to the radio, watch television, warm up food in a microwave oven or use our mobile phone. EMF are also generated when electricity is produced (e.g., power plants) and distributed (e.g., power lines), and whenever we use an electric appliance at home or in work. EMF sources also occur in nature and include the earth's magnetic field, that causes compasses to point North, or the electric fields produced in the atmosphere during lightning storms. EMF are also emitted by the Sun and even by our own bodies.

Electromagnetic Compatibility (EMC) relates to the ability of different electromagnetic devices to function properly when they are situated in the same environment, i.e., it relates to the compatibility between different devices. Electromagnetic devices can generate and propagate energy causing electromagnetic interference (EMI). Devices can also receive and be interfered with by energy generated and propagated by other devices in the same environment. If an electromagnetic device is not compatible with other devices in the same environment, EMI can lead to the device not functioning properly.

3.14.1.1 *Guidelines*

The EU Council 'Recommendation on the limitation of exposure of the general public to electromagnetic fields' (0Hz to 300GHz) 1999/519/EC outlines a set of both 'reference' and 'restriction' levels for limiting overall exposure to electromagnetic fields and ensuring an increased level of protection.

This recommendation is based on the International Commission on Non-Ionising Radiation Protection 'Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300GHz)'. Health Physics 74 (4): 494-522; 1998.

The electric and magnetic fields associated with Ireland's transmission grid do not exceed the recommendations of EU1999/519/EC.

EirGrid, who is responsible for Ireland's electricity grid operates to stringent safety recommendations set out by the EU as well as national and international agencies. These recommendations are based on peer-reviewed medical and health studies, independent of any grid operator.

EirGrid has reviewed the current and voltage of every transmission circuit in the country every hour for a year. These averages were then used to determine the typical electric and magnetic fields near our lines. The results are shown in Table 2-2 herein and on EirGrid's website²³.

Magnetic flux densities for AC magnetic fields are reported using units of microtesla (μT) and AC electric fields are reported as Volts per metre (V/m).

Table 2-2 shows that the restriction level for electric fields is 9000 V/m. With regards to 110kV cables the result is negligible. Table 2-2 also shows that the magnetic field restriction level is 360 μT , whereas 110kV cables is 11.53 μT when standing directly above the circuit. This is still well below the 360 μT restriction level.

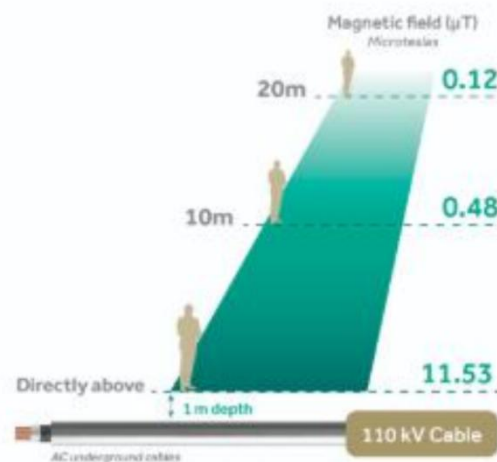
Table 3-1: Electromagnetic Fields in Ireland (Source: <https://www.eirgrid.ie/EMF>)

Type of field	EU/ICNIRP restriction level	Highest level calculated for 400 kV	Highest level calculated for 220 kV	Highest level calculated for 110 kV
Electric field (V/m)	9,000	N/A	N/A	N/A
Magnetic field (μT)	360	43.27 (1m above the ground directly above the circuit)	30.74 (1m above the ground directly above the circuit)	11.53 (1m above the ground directly above the circuit)

It is also important to note that the strength of both magnetic and electric fields drops significantly with distance (away from the source) as shown in the image below. Standing directly above the cable has a 11.53 μT magnetic field (below recommended restriction levels) which significantly reduces further to 0.48 μT at a distance of 10 m.

²³ <https://www.eirgrid.ie/EMF>





As described in EIAR Chapter 5 (Population and Human Health), the proposed underground electrical cables will adhere to the international guidelines for ELF-EMF (Extremely Low Frequency Magnetic Field) which are described by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). This is a formal advisory agency to the WHO. The proposed wind farm will also adhere to the EU guidelines for human exposure to EMF (Electric Magnetic Field). As the ICNIRP guidelines will not be exceeded, even directly above the underground cables, there will be no associated operational effects on Human Health.

3.14.1.2 Pacemaker Interference

“The likelihood of an adverse impact to a pacemaker or other implanted cardiac device from a power line is extremely small given the low levels of electric and magnetic fields typically measure so close to the line, where the fields would be highest”.²⁴ As noted in Table 2-2, the levels associated with a 110kV cable which is proposed for this project, are well below the guidance thresholds when standing above, decreasing further with distance.

110kV cables and overhead lines are also located through Ireland and generally are not considered to pose a risk to pacemakers, as EMF levels around such infrastructure are within international safety guidelines. Also modern implanted cardiac devices are equipped with multiple design features and internal circuitry specifically engineered to mitigate electromagnetic interference.

3.15 LANDSCAPE AND VISUAL IMPACT

Given the high number and consistent nature of the issues raised, these will be addressed by way of themes rather than on an individual basis. The themes addressed herein are:

1. The scale of the proposed turbines and their perceived visual dominance at surrounding receptors;
2. Impacts at surrounding amenity and tourism receptors – perceived effects at Birr;

²⁴ <https://www.eirgrid.ie/EMF>

3. Perceived cumulative impact of the Proposed Project; and
4. Perceived inadequate setbacks from the nearest surrounding residential receptors

This Landscape and Visual submissions response relates to the application for the proposed Ballincor Wind Farm located within the townlands of Cloonaheen, Ballincor Demesne, and Curralanty, County Offaly, and Clonfree, Castletown and Cronekill, County Tipperary.

A number of observations have been received from the public in relation to the proposed wind farm with some being focussed on the potential landscape and visual impacts of the Proposed Project. As Macro Works Ltd prepared the Landscape and Visual Chapter, it is deemed appropriate that we should respond to the LVIA aspects of the Statutory Consultee and 3rd Party observations.

3.15.1 *Response to Observations*

Greater Birr Wind Action Group (Observation prepared on behalf by BPS Planning and Development Consultants)

The observation presented on behalf of the Greater Birr Wind Action Group is an extensive one comprising of 867 pages and in addition to landscape and visual points made within the main body of the observation, Appendix 5 – ‘Landscape and Visual Impact’ extends to 78 pages in its own right. Given the detail and range of issues raised in this particular observation and the fact that it represents a local group (rather than an individual), it will be the initial focus of this response to LVIA observations. Addressing the issues raised in this observation, is likely to address the general LVIA related issues of many of the other observations.

The observation relating to the Landscape and Visual Impact Assessment (LVIA) is substantially contained in Appendix 5 which is structured into three ‘Parts’, five ‘Principle Failures’ and establishes 26 ‘Grounds’. The observation also contains alternative LVIA assessment and conclusions using detailed approaches and methodologies. However, it should be noted from the outset that these are not consistent with LVIA Guidance and best practice for wind energy developments in Ireland.

It is considered that the most appropriate level of response is at the more granular level of the 26 ‘Grounds’ associated with the suggested ‘Principle Failures’ of the project LVIA. Relevant sections of Appendix 5 of the observation will be referenced in the context of responding to those ‘Grounds’ and each will be identified and addressed in order below:

Observation Ground 1– The LVIA misclassifies the landscape sensitivity of the site, contradicting the adopted Offaly County Landscape Character Assessment, which designates the area High/Moderate sensitivity.

Response to Ground 1

The observation is factually incorrect and this point is central to many of the arguments contained in the observation. None of the proposed turbines is contained within the ‘High’ sensitivity landscape classification area. One turbine is contained in a ‘Moderate’ sensitivity area, but within an area of cutaway peatland and the remaining turbines (within County Offaly) are all contained in a ‘Low’ landscape sensitivity zoning. Consequently, the ‘Medium-low’ landscape sensitivity assessment within the project LVIA is considered to be a reasonable one.



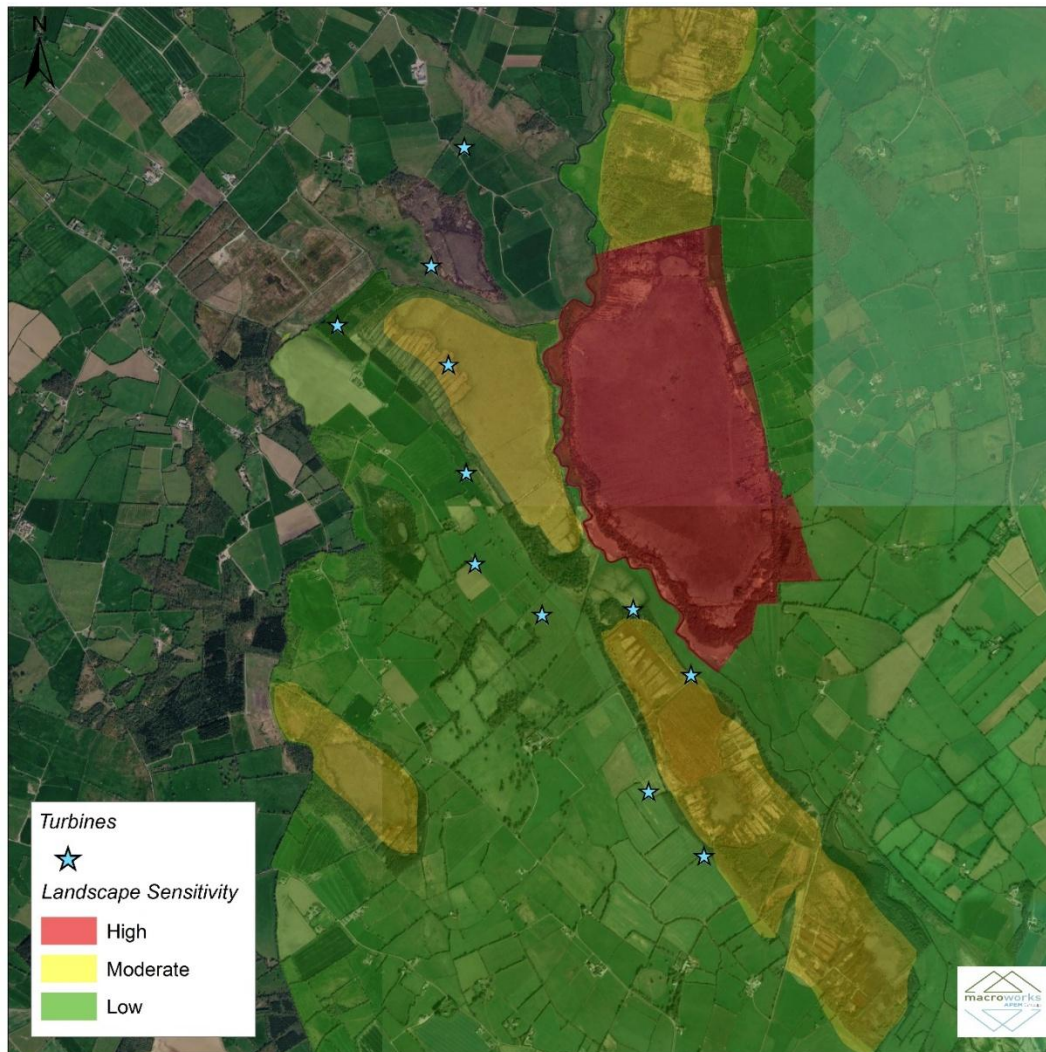


Figure 3-2 Landscape Classification

Notwithstanding, the nuances of mapped boundaries between landscape sensitivity zonings, the landscape should not be read in such a compartmentalised manner and boundaries between landscape classification units are seldom as abrupt on the ground as they appear in CDP maps. This landscape reads as a flat to gently undulating combination of productive agricultural land, cutaway peatland and peatland fringe scrub and commercial forestry. The Offaly CDP has taken the somewhat unique approach of classifying peatland areas and cutaway peatland areas as being of High or Moderate landscape sensitivity and this would not necessarily conform with a more universal approach to classifying landscape sensitivity. Whilst the CDP classifications are an important consideration in the LVIA, they are not definitive and in accordance with relevant Guidance (GLVIA3) the landscape specialist should arrive at their own conclusions regarding landscape sensitivity that are specific to the project scale.

Observation Ground 2 – *That misclassification [above] is not marginal or boundary-dependent: the site sits squarely within the High/Moderate-shaded area, and no reading of the adopted mapping supports the "Moderate and Low" characterisation.*

Observation Ground 3 – *Because sensitivity is the foundational input to the applicant's significance method, the error propagates through every significance finding in the chapter, which are accordingly unreliable at source.*

Observation Ground 4 – *The demonstrated misstatement of a verifiable matter of public record undermines the reliability of the professional judgements throughout the chapter that the Commission cannot independently verify.*

Response to Grounds 2, 3 & 4

As set out above, the observer's reading of the CDP sensitivity mapping is incorrect and therefore all of the subsequent references to the project LVIA having misinterpreted the landscape sensitivity classification are unfounded.

Observation Ground 5 – *The characterisation of the landscape as "robust" peatland minimises its settled, inhabited residential character and thereby suppresses the receptor sensitivity that character requires.*

Response to Ground 5

As described above in response to Ground 1 and throughout the project LVIA, that the 'robustness' of this landscape relates to its potential to absorb further development, and specifically wind energy development, without undue impact on its prevailing productive rural character. It is a settled rural landscape, but similar in context to rural environs throughout the country and with a settlement pattern that generally avoids peatland areas and peatland fringes where the proposed turbines are located. Indeed, the population density in most lowland agricultural areas throughout the country does not afford the required separation distance between dwellings and turbines to facilitate a viable wind farm development, unless broad peatland areas are also present.

Observation Ground 6 – *The description of the terrain as "quite flat" omits the bowl topography: 301 of 312 dwellings sit at or above turbine-base elevation, and 161 sit above the lowest point of the rotor sweep, looking into the rotor plane against open sky.*

Observation Ground 7 – *The LVIA assesses receptors as ground-level observers of structures on level terrain, systematically understating effect in a configuration where elevated receptors see more, not less.*

Response to Grounds 6 & 7

The observer has placed considerable emphasis on the ground level of the proposed turbine bases relative to surrounding dwellings coupled with extensive analysis of relative ground levels in an attempt to use this as justification for assessing higher visual effects. Not only does this alternative approach not correspond with guidance or best practice for LVIA, but it also attempts to override the way in which the proposed wind farm will actually be experienced on the ground, which is best represented by photomontages from representative viewpoints (in accordance with guidance and best practice). LVIA is based on experiential considerations, not mathematical formulas and distorted ground level graphs.

The landscape surrounding the proposed wind farm, particularly within the central study area is flat to gently undulating and whilst ground levels do generally increase away from the proposed

wind farm site, the increase occurs subtly over kilometres such that it is not obvious. It does not generate the open amphitheatre-like views suggested by the observer, which they then attempt to illustrate using drone images captured from well above ground level. While there are some open views of the proposed wind farm afforded from slightly elevated viewpoint locations within the surrounding area, such as VP23, these are highly legible views of the turbines where they can be clearly seen within the broad peatland fringe landscape context and where, if anything, the downward view deemphasises the heights of the turbines in the opposite manner that an uphill view can make them appear taller. The more common view is of the proposed turbines rising above and between intervening vegetation when seen from the surrounding lowland context.

The key point here is that the assessment contained in the project LVIA is undertaken by a suitably qualified and experienced LVIA Specialist and based on 27 representative views likely to be experienced by people at ground level from a range of viewing angles, distances and landscape settings within the study area. This approach is consistent with relevant guidance and best practice, unlike the observers approach.

Observation Ground 8 – *The linear north-south turbine array maximises the horizontal spread of visual effect, leaving no direction from which a clear horizon is preserved – the maximal form of the "crowding and domination" of flat landscape that WEDG 2006 specifically cautions against for this very landscape type*

Response to Ground 8

The linear array responds to the underlying landscape pattern and traces the peatland / farmland fringe. The layout will appear condensed when viewed from the northwest or southeast along its long axis, but will have a modest lateral extent. When viewed from the northeast or southwest it will have a much broader lateral extent, but with a more relaxed and even spacing and fewer instances of turbine overlap. These differing viewing scenarios do not support the observers contention that there will be "no direction from which a clear horizon is preserved" or that the turbine array "crowds and dominates" the flat landscape – the latter reference having been inappropriately cited from the cumulative section of the guidance.

In response to the WEDG design guidance for 'Flat Peatlands' the proposed wind farm design is consistent with all of the following points;

- *"Wind energy developments can be placed almost anywhere in these landscapes from an aesthetic point of view".*
- *"The vast scale of this landscape type allows for a correspondingly large spatial extent for wind energy developments".*
- *Regular spacing is generally preferred, especially in areas of mechanically harvested peat ridges*
- *"In open expanses, a wind energy development layout with depth, preferably comprising a grid, is more appropriate than a simple linear layout. However, where a wind energy development is located close to feature such as a river, road or escarpment, a linear or staggered linear layout would also be appropriate."*

- *“Aesthetically, tall turbines would be most appropriate”.*

The fundamental principle relating to the WEDG Guidelines irrespective of landscape type is layout legibility and response to setting. The design of the proposed wind farm responds well to its setting and is not at odds with any of the guidance for the relevant landscape types.

Observation Ground 9 – *Of 31 total VPs, a total of FOUR viewpoints sit within 2km of the development with ELEVEN viewpoints sitting beyond 10 km, concentrating the assessment at distances where effect is inherently diminished and unrepresentative of the affected population (median 7.3 km vs 1.7 km).*

Response to Ground 9

There were actually 27 views used for the visual impact assessment and five of these are located within 2km of the site, bearing in mind that there is not a dense network of roads in the peatland fringe farmland context within 2km of the site. Eleven of the 27 viewpoints are within 5km of the site and this zone is referred to as the Central Study Area throughout the LVIA, this being an important distinction because viewpoints inside 5km are considered to represent the ‘Local Community’ as a visual receptor type. Eighteen of the selected viewpoints were also within 10km of the site, highlighting a general concentration of viewpoints towards the centre of the study area, but also acknowledging that viewpoints beyond 10km are important to a robust LVIA where a 20km radius study area is specified by guidance (WEDG 2006).

Overall, it is considered that 27 viewpoints is an appropriate number that is consistent or even higher than dictated by best practice for wind farm LVIA in Ireland (typically 20-25 VPs). The spread of these viewpoints throughout the study area allows for a robust visual assessment that considers a range of viewing angles and distances, but more importantly, relevant visual receptors within the study area. It should be noted that some viewpoint locations are specific to a particular point receptor such as a hilltop or heritage feature, but others such as those representing Major Routes or Local Community views are more flexible in their location and are generally selected on the basis of affording open views of the Proposed Project.

Observation Ground 10 – *The selected viewpoints do not present the worst-case, most-open available view required by WEDG 2006; they repeatedly rely on intervening trees, hedgerows, terrain or oblique angles to reduce apparent magnitude, reversing the guideline's logic.*

Response to Ground 10

This is the most common of all observations made in relation to LVIA for any form of development and is often founded on a belief that the project LVIA specialist is trying to downplay visual effects by deliberately selecting obscured views. For this very reason, the opposite is true in the interests of undertaking a robust assessment where the VP selection can be readily defended. Every attempt is made to try and select views with open visibility of the Proposed Project that still remain relevant to the receptor in question.

On review of the photomontage set, it is apparent that none of the views has been selected with screening elements in the immediate foreground. Instead, they are captured from gateways and road sections with clear foreground context to give the greatest potential for visibility from the receptor in question. There are numerous viewpoints from elevated locations within the wider study area affording clear views towards the development and GAA grounds have been used for

a couple of the centre of population receptor because, along with elevated churchyards, these tend to afford either elevated views or uninterrupted foreground views from within settlements. Two exceptions to the above are VP1 from Meelick Harbour and VP26 inside Birr Castle Demesne where the views are used to illustrate the absence of effect from key receptors that do not otherwise afford clearer views. The use of 'illustrative views' for this purpose is supported by the GLVIA3 Guidelines.

Whilst it is accepted and fully expected that there are other locations within the study area that might afford clear views of the proposed wind farm, it is not accepted that the selected viewpoints do not reflect a fair and reasonable selection of representative viewpoints from which to base the visual impact assessment.

Observation Ground 11 – The photomontage set was captured at its seasonal and atmospheric best – summer foliage, sunny hazy skies against which white turbines recede – with no winter or overcast condition assessed, despite overcast conditions prevailing for most of the Irish year.

Response to Ground 11

Again, on review of the photomontage set it is clear that none of the viewpoints relies on foliage screening in the foreground to the extent that it would alter the assessment of visual impact during winter. Views almost always have a clear foreground context as they were selected with this in mind. It is important to note that typical hedgerow and treeline vegetation beyond the foreground context will retain much of their screening effect even in winter months due to the dense veil of winter branches as visual permeability reduces with viewing distance – the 'net curtain' effect.

Capturing baseline photography during summer months is preferable because lighting and visibility conditions tend to be better than during winter months and there are more hours of acceptable light within the day to capture optimal photography. Every attempt is made to capture photography in clear viewing conditions and all of the photography used in the photomontage set is captured on clear bright days, albeit with cloud cover apparent in some views, as is common in Irish skies. It should be noted that there have been instances in the past where planning authorities have requested updated photography because of overcast conditions, which is contrary to the observers suggestion of using overcast conditions.

It is not considered that the seasonality or lighting conditions present in the baseline photography has any material bearing on visual impact assessment and certainly not in the context of understating effects.

Observation Ground 12 – The montages lack adequate scale reference (houses, roads, known structures), denying the reader any means of judging the true scale of a 180 m turbine.

Response to Ground 12

This statement is factually incorrect. All photomontages contain intervening landscape elements that the eye naturally references when determining scale. To spin this argument around – there are actually no views in which the scale of the proposed turbines is at all ambiguous due to the absence of scale references. Furthermore, the photomontages have been produced and presented in full accordance with relevant visualisation guidance so that the scale of the proposed turbines is appropriately represented.

Observation Ground 13 – *The densest receptor clusters within the 5 km study area have no effective viewpoint representation; an assessment that misses where the affected population is concentrated cannot claim to have assessed the effect on that population.*

Response to Ground 13

As stated above in response to Ground 9, Local Community views have some degree of flexibility in terms of their selected location. It is not feasible or recommended by LVIA guidance to represent every dwelling or dwelling cluster within the Central Study Area and therefore, the most robust approach is to try and represent a good range of viewing distances, viewing angles and visual contexts such that the scale and nature of local views is well represented. This was the approach used in the project LVIA rather than focussing on locations adjacent to dwellings or clusters of dwellings.

Observation Ground 14 – *Birr (population approximately 5,000, on rising ground overlooking the site) is effectively unassessed, represented only by a rugby club on its southern edge and an enclosed demesne where screening is maximal; Shinrone and Riverstown are unassessed entirely.*

Response to Ground 14

It is important to note that Birr Castle and its demesne is an important recreational and heritage receptor in its own right and it was necessary to include a viewpoint that represented it even though that was fully enclosed by vegetation. Birr is a relatively flat and low lying settlement at the confluence of the Camcor and Little Brosna Rivers. Broad views of the surrounding rural hinterland are not generally afforded from within the town and it is considered that the open view from the GAA ground within the southern (project side) outskirts of the settlement (VP6) represents a good representation of the nature of visibility from this receptor.

It is acknowledged that the observer has managed to locate a ‘Streetview’ image from what appears to be an elevated cul-de-sac nearly 1.5km from the centre of Birr where more open views of the proposed turbines will likely be afforded for approximately two residences - noting also that there does not appear to be other similar views in the vicinity. Whilst this would represent a greater degree of visual exposure than VP6, it would not represent a significant visual effect and it does not represent the visibility for the vast majority of the population of Birr. This is why selecting worst-case-scenario views always has to be balanced by remaining relevant to the receptor in question.

Observation Ground 15 – *The night-time environment is not assessed: aviation lighting is disposed of in a single paragraph with no montage, no viewpoint, no receptor analysis and no entry in the visual-effects table, contrary to LITGN-2024-01 Cl. 8(2), in a rural low ambient-light setting where it would introduce a new, repeated effect.*

Response to Ground 15

It should be noted that the *LITGN-2024-01 Cl. 8(2)* cited without reference by the observer is from the GLVIA3 clarifications document produced in 2024. Importantly, the first part of that clause states that “A night time assessment should not be a routine requirement and will only be required where lighting will have a potential significant influence on landscape character and/or visual amenity, as a result of the combination of the sensitivity of the receiving night time

environment and the nature of the proposed lighting". The project LVIA acknowledged that there will be some minor impacts from aviation safety lighting on the nacelle of the proposed turbines, but in terms of receptor sensitivity, this is not a recognised dark skies reserve and the nature of the lighting – to be seen rather than to illuminate – is not of an intensity that is likely to generate significant night time effects.

Observation Ground 16 – *The "Medium-low" residential sensitivity rating is unsupported by the chapter's own stated criteria and contradicts GLVIA3's express identification of residents at home as among the most susceptible receptors; corrected to High, the chapter's own findings cross its significance threshold.*

Response to Ground 16

What the observer fails to recognise in their analysis of GLVIA3 visual receptor sensitivity guidance is that overall receptor sensitivity is derived from a combination of viewer susceptibility and the view value associated with the afforded view. The project LVIA acknowledges that residents at home are among the most 'susceptible' visual receptors, but the value of a view is generally associated with a consensus on visual amenity for the population rather than the individual and LVIA is principally concerned with the latter. View value might be formally recognised in the form of a scenic designation in the County Development Plan or associated with rarity and distinctiveness. It might relate to the presence of naturalistic or heritage features or it might be associated with the vastness and rich complexity of a view from an elevated location. Although residents might value the views afforded from their property, that does not necessarily hold for the wider population. The project LVIA balances viewer susceptibility and view value to arrive at a lower overall visual receptor sensitivity for the local community than the observer has determined from a cursory interpretation of GLVIA3.

The reason it is important to balance the sensitivity factors (susceptibility and view value) is further highlighted throughout the observation where defaulting to a 'High' visual sensitivity for the entire local population renders visual effects at 88% of the 312 dwellings within 3km of the turbines as being Significant – according to the observers own visual impact study. Such a finding for an LVIA, aside from not being in accordance with guidance and best practice, provides the public and Planning Authority with little value in understanding and weighing the overall acceptability of a project in EIA terms. All commercial scale wind farms would default to wholesale significant landscape and visual effects within at least 3km. Consequently, LVIA would likely be ignored as a determining / differentiating factor when assessing developments, especially in a national policy context that is generally supportive of renewable energy development where it does not give rise to unacceptable environmental effects. By contrast, the project LVIA which is calibrated by guidance, best practice and experience in undertaking over 250 previous wind farm LVIAs allows the public and Planning Authority to readily identify the highest levels of impact and where they occur, notwithstanding that it ultimately concludes that significant effects will not arise from this Proposed Project. It allows exceptional receptor sensitivity and/or effects to stand out rather than having them lost in a weight of over-estimated significant effects applied to common and broadly acceptable scenarios.

Observation Ground 17 – *The magnitude ratings are independently suppressed, understating the proportion of the array in view and the scale relationship at the distances the population actually occupies.*

Response to Ground 17

The observation suggests that visual impact magnitude judgements are lower than the criteria description in the LVIA methodology. However, it should be noted that the criteria descriptions have to be broad enough to deal with a large spectrum of projects types from data centres that might completely block a view, to urban developments that completely alter a street scene and, of course, wind farms rising out of a rural context such as this. The criteria deal with not only the scale and extent of visual change, but the nature of that change relative to the baseline setting and its effect on visual amenity. Just because the proposed turbines are tall and noticeable features does not mean that they default to a 'High' or 'Very High' magnitude of impact from all receptors within a certain distance. Wind turbines are slender kinetic structures, the appearance of which is not universally disliked (see Failte Ireland: Report On Visitor Awareness And Perceptions Of The Irish Landscape - 2018). They may intrude on views but never block them and do not contribute to a sense of enclosure in the manner that a solid structure might. Wind farms are now a familiar and characteristic feature of Irish rural landscapes including the project study area and there are positive connotations associated with them in terms of production of renewable energy. That is not to suggest that local residents would welcome the view of wind turbines and the negative visual effects of the proposed wind farm are well documented throughout the LVIA. However, the visual impact magnitude involves more than just how noticeable a proposed feature is and that point appears to be missed by the observer.

Observation Ground 18 – *"Neutral" landscape-quality findings contradict the chapter's own default characterisation of the receiving landscape*

Response to Ground 18

For wind energy LVIA the use of a 'Neutral' quality of visual effect is almost always reserved for instances in which the proposed turbines are not visible or barely discernible within a scene due to screening and/or distance, and even if noticed by the viewer they do not materially reduce the visual amenity of the viewer. This is considered a reasonable approach that aligns with relevant guidance and best practice. The Observer has misinterpreted section 12.2.4.1 of the LVIA where it acknowledges that *"In the case of commercial wind energy developments and the associated introduction of new kinetic structures within rural and upland areas, the quality of the landscape and visual effects will almost always be negative, rather than positive, and unless otherwise stated is the default quality of any identified effect"*. Importantly, it immediately goes on to clarify that - *"Where effects are imperceptible or not possible as a result of distance, context, or views being screened by foreground elements, effects are considered Neutral as the proposals neither improve nor reduce the quality of the environment"*.

Observation Ground 19 – *"Moderate" effects are left unexamined as to significance, contrary to LITGN-2024-01 Cl. 3(5), which requires effects in the middle of the scale to be explicitly justified as significant or not.*

Response to Ground 19

The observer is factually incorrect in this statement as the methodology of the assessment clearly sets out which impact levels are deemed to be significant or not significant in table 12.4 which colour codes effects of 'Substantial' and above in bright yellow and then states, "*Judgements deemed 'Substantial' and above are considered to be 'significant effects' in EIA terms*". Furthermore, throughout the LVIA, statements of significant are reiterated after each assessment section to clearly identify whether the assessed effect is deemed significant or not significant. LITGN-2024-01 Cl. 3(5) begins by stating "*it is not necessary to establish thresholds for levels of significance, provided that it is made clear whether effects are, or are not significant*". As the significance threshold has been made clear in the project LVIA, the rest of this section of the GLVIA3 clarifications document is irrelevant.

Observation Ground 20 – *The chapter concedes the long duration of the effect and then fails to carry that concession into its significance conclusions*

Response to Ground 20

The 'duration' of effect is included as part of the significance judgements within the LVIA, but along with the 'quality' of effect, it kept separate from it. This is because it needs to be acknowledged, but does not contribute to the significance judgement to the same degree as the scale and nature of the effect. The LITGN-2024-01 clarifications document discusses duration of effects mainly in the context of whether temporary or short term duration impacts might reduce the overall significance of effect rather than whether medium, long term or permanent duration of effects increases overall significance. The relevant Clause 3(3) states:

"The landscape professional should apply their judgement, explaining in the method how components have been combined. For magnitude it is likely that the size/scale of effect will be the most important factor, with geographical extent and duration considered as 'slight modifiers' where effects are particularly restricted or widespread; or particularly short in duration. Examples where geographical extent and duration might influence magnitude include: if a development will be seen in close view, but only through one gate along an otherwise hedge-screened road; or if a source of impact would only be present for a few weeks or months."

In the context of the project LVIA, the 'long-term' duration of the project does not increase the significance of effect beyond the level that has been assessed – it just acknowledges the duration of operational stage effects.

Observation Ground 21 – *The significance findings rest on scoring matrices applied mechanically, without the reasoned narrative LITGN-2024-01 Cl. 3(6) requires; the matrix is permitted to dictate the judgement rather than illustrate it*

Response to Ground 21

This observation is factually incorrect. Tables and matrices are only used within the LVIA to set out threshold criteria provide a structured understanding of the assessment methodology. All landscape assessments (Section 12.4.2), visual assessments (Section 12.4.3 and Appendix 12.1) and cumulative assessments (Section 12.4) are supported by detailed descriptions of the nature of receptors, the scale and nature of impacts and the rationale for arriving at significance judgements. LITGN-2024-01 Cl. 3(6) states (in its entirety); "*Diagrams or matrices can be useful as a means of illustrating to the reader how judgements are combined, but should not dictate*

judgements. LVIA is a means of documenting professional judgement, rather than a formulaic process. All judgements need to be supported by clear description”.

This observation ground appears to have cited a section of guidance without any regard to whether or not the project LVIA actually accords with it or not.

Observation Ground 22 – The cumulative assessment is conducted at landscape level and never reaches the individual receptors, where the cumulative effect is actually experienced.

Response to Ground 22

By ‘individual receptors’ it is assumed that the observer has returned to the point that individual dwellings are not assessed in the LVIA and therefore in the cumulative impact assessment. As stated previously, LVIA is undertaken in the public interest using a sample of representative viewpoints that cover the likely scale and nature of effects on the local and wider population.

The cumulative section of the LVIA (12.4.4) begins by assessing cumulative landscape effects, but contrary to the assertions of the observation, it then moves onto cumulative visual impacts. In accordance with relevant guidance, wireline images of identified cumulative developments are provided in the photomontage set and these are used to identify and assess cumulative visual effects at each of the representative viewpoints. In this instance, only a small subset of the viewpoints, where cumulative effects are actually likely to occur, are referenced in the assessment. From the majority of the representative viewpoints there will be no cumulative effects and this is also a key consideration of the cumulative assessment.

For the reasons outlined above this observation ground is unfounded.

Observation Ground 23 – The permitted Carrig development (ABP-318689-23) is not properly brought into the cumulative baseline, contrary to LITGN-2024-01 Cl. 7(3), which requires existing, permitted and proposed wind farm to be assessed together

Response to Ground 23

It is unclear why the observer considers that the permitted Carrig Wind Farm development is not properly brought into the cumulative baseline. It is contained in the list of cumulative developments, is present on the cumulative ZTV map and also present in the cumulative wireline images in the photomontage set. It is then specifically considered within section 12.4.4 – Cumulative Effects. Indeed, within the cumulative baseline and assessment, it is given the same treatment as if it was an existing wind farm. The only part of the baseline where it is not considered is in the existing baseline section (Section 12.3) because it does not yet exist and does not currently contribute to the landscape fabric / character described in that section. This approach fully accords with relevant guidance and best practice for LVIA generally, and the cumulative impact assessment of wind farms specifically.

Observation Ground 24 – The dismissal of the cumulative ZTV – which shows all receptors and the principal population centres exposed to more than 66% of turbines cumulatively – is self-serving and unevicenced.

Response to Ground 24

It is important to note that no part of the cumulative assessment dismisses the cumulative ZTV map, but it does highlight that like the standard ZTV map, it is based on a theoretical bare-

ground scenario that does not actually occur in reality and that limits its value in understanding the true nature of cumulative effects. Section 12.4.4 goes on to state; *“Notwithstanding the theoretical potential for cumulative visibility in a bare-ground scenario, it is clear from the photomontage set and the relatively limited intervisibility with the nearby Lacka Wind Farm that the cumulative ZTV map considerably overrepresents actual cumulative effects and a more detailed analysis of the likely cumulative visual impact is provided below based on the photomontage set”*.

The assessment is not ‘unevidenced’ – it is based more on the photomontage set than the ZTV map because the former better represents the reality of cumulative effects. By stating that *“all receptors and the principal population centres exposed to more than 66% of turbines cumulatively”* the observer has misinterpreted the theoretical nature of the cumulative ZTV map and dismissed the clear rationale contained in the LVIA as to why it is of limited value in this landscape context.

Observation Ground 25 – *The WEDG cumulative test for Flat Peatland, warning against layouts that crowd and dominate the flat landscape, is failed on the chapter's own classification of the receiving landscape.*

Response to Ground 25

It is not clear what point this observation ground is attempting to make other than a misinterpretation that the WEDG would preclude the proposed wind farm on cumulative impact grounds because the ‘Flat Peatland’ landscape type guidance is relevant. The cumulative guidance for ‘flat peatlands’ does caution against “crowding and dominating the flat landscape” because of the likely “openness of vistas across these landscapes”, however it is clear from the sample images used in the WEDG that it is referencing vast cutaway peatlands. It is important to note that the WEDG also acknowledges that more than one landscape type might be relevant to a proposed wind farm development and in this case the LVIA highlights that the ‘Hilly and flat farmland’ landscape type is also relevant because of the peatland fringe farmland setting of the turbines and the flat to gently undulating nature of the topography. The guidance for ‘Hilly and Flat Farmland’ includes the following in relation to cumulative effects; *“given that these landscapes comprise hedgerows and often hills, and that views across the landscape will likely be intermittent and partially obscured, visibility of two or more wind energy developments is usually acceptable”*. On this basis the proposed wind farm is not precluded by WEDG guidance – it is in general accordance with it.

Observation Ground 26 – *The receptor-level cumulative analysis the chapter omits demonstrates that the addition of the neighbouring developments tips multiple clusters from the margin of significance into clear significance (e.g. SV15, VP12, SV19), raising the significant-effect proportion from 88% to 92% of dwellings.*

Response to Ground 26

The assumption of this observation ground is based on the observer's own assessment of visual impacts at individual dwellings which has already been highlighted as flawed. This is because it is not based on relevant guidance and best practice and defaults to extreme judgements in relation to both receptor sensitivity and impact magnitude based on a cursory interpretation of assessment criteria. Using that visual impact assessment as the foundation of a cumulative

impact assessment, it is not surprising that the cumulative assessment simply bumps up the significance statistics already arrived at. The fact that significance is even expressed as a percentage of dwellings illustrates how far from recognised LVIA methodology the observers' alternative assessment is.

3.15.2 *Response to General Third Party Observation LVIA issues*

There are numerous third other party submissions to the application and unlike the Greater Birr Wind Action Group observation, they tend to focus on concerns with the proposed wind farm rather than the methodology of the assessments. Many of the landscape and visual related issues are common across the observation so it is considered more useful to respond to the issues by theme rather than respond repetitively in respect of each submission. The common themes / distinctive issues that will be addressed include;

Turbines too tall

Industrialisation of the rural landscape

3.15.3 *Turbines too tall*

Many of the 3rd party submissions take issue with the height of the proposed turbines, considering them to be too large for this rural setting and comparing them to other well-known tall features.

By way of response, it is important to note that comparison with other tall features is only relevant when their setting is similar and their form / function comparable. The proposed turbines will be visible within a broad scale rural landscape setting where they may be prominent in some instances, but due to the slender form and set back distances from roads and residences, they do not appear overbearing or spatially dominant within this landscape setting or views of it.

Although 180 m turbines are notably larger than the first generation turbines that were constructed in Ireland as the wind energy industry emerged around 25 years ago (such as the nearby Lacka turbines at 80 m tall). However, the proposed turbines would be consistent with the height of turbines being proposed and consented within the last 5-10 years. A number of wind energy applications have also been submitted and granted in recent years with turbines at or in excess of 200 m. These tend to be in broad peatland settings, but by the same rationale, the proposed 180 m tall turbines do not appear over-scaled in their broad peatland fringe context. This is reflected in the findings of the LVIA Chapter, which acknowledges several mid to high range effects, but none that are deemed significant.

3.15.4 *Industrialisation of the rural landscape*

Many of the 3rd party submissions contend that the proposed wind farm will spoil the natural beauty of the area and contribute to the industrialisation of the rural landscape.

By way of response, local residents will invariably and understandably extol the virtues of their local landscape, however, it is important that the LVIA takes an objective stance and also considers the receiving landscape in the national and regional context in terms of

distinctiveness, quality and value. In this instance, the LVIA highlights that in accordance with the Offaly County Development Plan 2021-2027 the receiving landscape is a general rural one with a predominantly 'Medium' or 'Low' landscape sensitivity designation and it is predominantly a productive and modified landscape rather than a pristine and naturalistic one. It should also be noted that there are no scenic designations (scenic routes / views) in any of the relevant County Development Plans within 5km of the site.

As a more general point, it is common for observers to claim that a proposed wind farm will contribute to the urbanisation or industrialisation of the rural landscape, however, this has connotations that do not reflect the reality of wind energy development in Ireland. It is accepted that the proposed wind turbines and ancillary structures will contribute to an increase in the scale, intensity and diversity of built development within the receiving rural landscape. However, wind turbines have become synonymous with rural, upland and cutover peatland areas in Ireland over the past 25 years – not urban or industrial areas. They are structures that require broad, exposed and often isolated settings to function effectively and tend not to be developed near urban areas due to issues associated with population density. Describing a structure as contributing to industrialisation of a landscape invokes images of bulky monotone buildings and chimney stacks - whereas wind turbines are structures of the rural landscape with a direct connection to the elements.

3.15.5 The scale of the proposed turbines and their perceived visual dominance at surrounding receptors

Concerns have been raised regarding the scale and height of the proposed turbines, with some observers suggesting that they will “dominate the skyline,” be “excessively large,” or appear “extremely visually intrusive.”

This combination of large-scale landform, broad land-use patterns, and existing vertical landscape elements provides an appropriate setting for turbines of the proposed height. This design approach is fully consistent with the Wind Energy Development Guidelines (WEDG, 2006) and the Draft Revised WEDG (2019), which state:

“Turbines should relate in terms of scale to landscape elements and will therefore tend not to be tall. However, an exception to this would be where they are on a high ridge or hilltop of relatively large scale.”

Overall, the Proposed Project is well integrated into this robust, working, elevated landscape, which is already heavily influenced by productive land uses, including pastoral farmland transitioning into commercial conifer plantations and existing wind energy development. Importantly, the draft WEDGs specifically provide for taller turbines in rural areas where a sense of spatial overbearing is avoided through the application of a height-based buffer from residential properties equivalent to four times the turbine tip height. For the proposed 180 m turbines, this requires a minimum setback of 720 m from the nearest residential receptor, with the exception of the involved landowner (550 m). The nearest dwelling to any proposed turbine is a minimum of 720 m, which complies with both the 2006 Guidelines (>500 m) and the Draft Revised WEDG (2019), with the exception of the property for which there are legal agreements in place (see Section 2.1.2.3).

The proposed turbine scale also reflects established industry trends, where taller turbines facilitate higher efficiency, reduced turbine numbers, and lower overall landscape clutter. This balancing of turbine size and turbine quantity is recognised in independent research commissioned by Fáilte Ireland (2007, updated 2012), which found that:

“...if both produced the same amount of electricity, tourists preferred wind farms containing a small group of large turbines (55%) to a large group of smaller turbines (18%).”

Overall, while the proposed turbines are substantial built structures, they are well assimilated in terms of scale and function within this relatively robust landscape, which is already strongly influenced by working land uses and existing wind farm developments.

In summary, while the proposed turbines are sizable structures, they are appropriately scaled within a robust, elevated, working landscape already characterised by large-scale land-use patterns and surrounding large-scale landscape features. The Proposed Project meets all required residential setback distances as per the WEDGs (current and draft revised), reflects contemporary best practice in wind energy design, and sits comfortably within a landscape previously found capable of accommodating turbines of similar or greater height.

3.15.6 *Perceived cumulative impact of the Proposed Project*

Submission

A number of submissions were received in relation to the Perceived cumulative impact of the Proposed Project.

Response

With regard to potential cumulative effects generated as a result of the Proposed Project, these are considered throughout the EIAR report as several of the surrounding wind farm developments are operational and form part of the baseline landscape context. A full analysis of potential cumulative effects is also included within Section 12.7 of the submitted LVIA report. The photomontages provided as part of the LVIA also include wireframes of all existing and consented wind farm development in addition to the proposed Ballincor turbines. This presentation of cumulative wind farm development is in full compliance with the best practice guidance for the presentation of photomontages for wind farm developments as set out in the NatureScot guidance. In addition to the wireframe views contained within the photomontage booklets, cumulative Zone of Theoretic Visibility (ZTV) mapping is also included within the LVIA report, which provides an analysis of the potential combined visibility of wind farm developments based on a bare-earth scenario within the study area. A summary of the potential cumulative effects generated by the Proposed Project is included below.

Overall, the proposed Ballincor Wind Farm would contribute a **Medium-low** cumulative landscape and visual impact, and cumulative effects associated with the development are therefore assessed as **Not Significant**. No other large-scale developments are present within the vicinity of the site. While forestry harvesting may locally increase visibility of turbines or access tracks at times, such activities are temporary and rotational in nature, and are not expected to result in significant cumulative landscape or visual effects.

3.15.7 *Perceived inadequate setbacks from the nearest surrounding residential receptors*

Submission

Several observations raise concerns regarding the perceived inadequate setback distances from nearby residential receptors.

Response

In this regard, it is important to note that the assessment of visual amenity with regard to the Proposed Project has been undertaken with reference to both the current (2006) and Draft Revised (2019) WEDGs. Section 6.18 of the Draft Revised WEDG (2019) refers to appropriate setback distances for visual amenity purposes. The guidelines outline a mandatory minimum setback distance of “500 meters” or the distance of “4 times the tip height” of the proposed turbines “between the nearest point of the curtilage of any residential property”. This is set out in Specific Planning Policy Requirements (SPPR) 2 of the Draft Revised WEDGs (2019). Whilst it is noted that these guidelines are still in draft form, out of an abundance of caution and as per current best practice, the applicant has designed the Proposed Project in full compliance with this policy.

The proposed turbine array has been designed to comply fully with the recommended setback standard. The proposed turbines have a tip height of 179.5 to 180 m, resulting in a recommended setback distance of 718 to 720 m ($4 \times$ tip height) from the nearest residential receptors. The layout of the proposed turbine array ensures that all turbines are located at or beyond this 720 m setback distance, thereby fully complying with the recommended separation distance contained within the Draft Revised WEDGs (2019) with the exception of a property for which legal agreements are in place and have provided letters confirming they do not object to the development (see Section 2.1.2.3 and the Planning Statement).

With regard to visual effects on surrounding local community receptors, including residential properties, 17 representative viewpoints were included in the assessment (VP2, VP4, VP5, VP7, VP8, VP9, VP10, VP11, VP12, VP13, VP14, VP15, VP16, VP17, VP19, VP21, and VP24). The significance of effects varies across these viewpoints, ranging from Slight to Substantial–moderate, with receptors located closest to the proposed turbines generally experiencing the most notable visual effects.

It should be noted that several of the representative viewpoints located closest to the proposed turbines, were classified as experiencing Substantial–moderate residual visual effects. However these effects are assessed as **Not Significant** in EIA terms. As outlined in the submitted LVIA, the proposed wind farm will introduce a noticeable degree of visual change within the immediate and central study area. However, while the proposed turbines, by virtue of their scale, will result in some detracting in visual amenity afforded from nearby receptors, the proposed turbines can be appropriately accommodated within the existing landscape context, which is characterised by extensive areas of conifer forestry, working agricultural lands, and existing wind energy infrastructure.

3.16 ARCHAEOLOGICAL AND CULTURAL HERITAGE WITHIN THE WIDER BALLINCOR AREA

Submission

Concerns were raised regarding the setting of archaeological and cultural heritage within the wider Ballincor area.

Response

Chapter 13 (Archaeology, Architectural and Cultural Heritage) of the submitted EIAR assessed the predicted impacts of the Proposed Project on the archaeological, architectural and cultural heritage resource. The assessment considered the sensitivity of the heritage receptor and the magnitude of the potential impact, and assigned a predicted significance of effect. The assessment concluded that although residual effects will remain with regards to the setting of archaeological, architectural and cultural heritage sites, these effects will not be significant or permanent, and will be removed following the decommissioning of the turbines.

3.16.1 *Archaeological Mitigation*

Submission

A submission questions whether the “preservation by record” approach is an appropriate form of mitigation.

Response

Although Chapter 13 (Archaeology, Architectural and Cultural Heritage) has confirmed that no known archaeological remains are located within the footprint of the proposed wind farm, the potential remains for previously unknown archaeological remains to survive below the current ground level. The mitigation measures described in Chapter 13 (Archaeology, Architectural and Cultural Heritage) include archaeological test trenching and archaeological monitoring, which will ensure that potential sub-surface archaeological remains are identified. The “preservation by record” approach is outlined in Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands 1999) and addressed in section 2.1.1 above. The approach ensures that archaeological remains are excavated under licence by suitably qualified archaeologists, and “ensures that, as a minimum, a complete and meaningful record is preserved of all archaeological deposits, features and information likely to be damaged as a result of the development” (DAHGI 1999, 25).

The submission questions that Chapter 13 (Archaeology, Architectural and Cultural Heritage) has not identified significant residual effects. The effects of the Proposed Project on the archaeological, architectural and cultural heritage resource range from imperceptible to moderate, prior to the application of mitigation. The assessment has followed the methodology defined in Chapter 13 (Archaeology, Architectural and Cultural Heritage), with the combination of a receptor’s sensitivity and the magnitude of impact resulting in the significance of effect.

3.16.2 *Archaeologically rich area*

Submission

A number of submissions note that the area is archaeologically rich and subject to statutory protection.

Response

EIAR Chapter 13 (Archaeology, Architectural and Cultural Heritage) has included both recorded and unrecorded archaeological, architectural and cultural heritage in its assessment, including sites subject to statutory protection. The submission notes that impacts are predominantly managed through monitoring rather than avoidance. This statement is incorrect. As part of the embedded mitigation, the proposed wind farm has avoided all recorded heritage receptors. Further mitigation includes archaeological test trenching across greenfield locations of the proposed wind farm and cable route. This will mitigate impacts to potential sub-surface archaeological remains that may be present. If any archaeological remains are present, further mitigation will be implemented as required and agreed with the National Monuments Service.

3.16.3 Strategic Infrastructure Development

This submission raises concerns that this project is not valid as an SID project due to output below 50MW. However, as noted within the planning documents and previous consultations with An Coimisiún Pleanála the installed output capacity range for this project is 61.6-77MW. The SID determination letter from An Coimisiún Pleanála was submitted as EIAR Appendix 1-2.

3.16.4 Separation distance between turbines

In Ireland there is no mandated single distance between turbines on site. Turbine positioning on the proposed site is site specific and has taken into consideration technical and environmental requirements including optimal spacing to avoid turbulence, wake effects, wind take, consideration of turbine position on the adjacent existing wind farm, turbine set back from sensitive receptors (e.g. residential properties), avoidance of environmental constraints, and land availability.

3.16.5 Swept Path Analysis/ Blade length

This submission queries the blade length used in the swept path analysis. As per EIAR Appendix 2-1, it is confirmed that the maximum blade length is 81.5 m. As detailed in Appendix 2-1, this blade length was used for the swept path analysis assessment for the TDR and site access.

3.16.6 Turbine Delivery Route (TDR) Works

This submission raises concerns regarding the TDR works and accessing private lands. In response it is confirmed TDR works will not trespass on private lands. Legal easement agreements are in place with each landowner as required for the identified pinch points. Submitted EIAR Appendix 2-1 presents the TDR report and highlights the pinch points along the route.

3.17 SHADOW FLICKER

A number of concerns regarding shadow flicker related to the general potential impacts there may be on households. The applicant is committed to near-zero" shadow flicker effects from the Proposed Project on the local community and is committing to ensuring a near-zero shadow flicker at the shadow flicker receptors identified within 1.63 km (ten rotor diameters) of the proposed wind turbine locations. As described in Section 16.5 of the submitted EIAR, these measures include turbine shutdown and screening, the latter of which will only be considered if the property is either naturally screened (by topography, buildings, vegetation, etc.) or where the homeowner is happy to accept such measures. These proposed mitigation measures are proven and widely used in the wind energy industry.

The Applicant's approach – combining industry-standard modelling, pre-construction verification, real-time sensor-controlled shutdown, and transparent 'near-zero' commitment – represents best practice in Ireland and internationally. The following addresses each submission received, demonstrating that the Proposed Project exceeds regulatory requirements and protects all sensitive receptors.

3.17.1 *Shadow Flicker Assessment*

Several submissions raised concern that the shadow flicker assessment does not model and adequately reflect lived experience and that the reliance on predicted compliance rather than real-world impacts is insufficient.

As described in EIAR Section 16.2.4 the shadow flicker analysis has been undertaken using WindPRO: Shadow – Version 3.6.361 (by EMD International) which is one of the leading industry software packages for carrying out a shadow flicker simulation. Submissions in relation to topography are incorrect. The model incorporates wind turbine configuration, terrain mapping, sun path throughout the year at the development latitude and defined receptors.

Furthermore, an updated model will be run at the pre-construction phase once the detailed specifications of the chosen turbine model are confirmed, on account that design flexibility has been sought for the proposed Ballincor Wind Farm. That will be used for the basis of the turbine control programme used should the wind farm become operational.

In relation to the baseline data, Birr data was utilised. While records exist for Gurteen, Birr was utilised in the calculation. Birr is the closest synoptic station to the proposed wind farm. Based on data from Met Éireann, Ireland's average sunshine hours have increased by 4.6% when comparing the 1991-2020 period to the 1961-1990 period²⁵. The use of Gurteen therefore was not used. Claims of 30% more sunshine at Gurteen are not supported. At pre-construction stage, once the detailed specification of the chosen turbine model are confirmed, the shadow flicker model will be updated along with sunshine statistics to consider any change in sunshine probability from the initial assessment to the date of the updated model.

The software is calculating shadow flicker under the assumption of a completely flat, bare landscape between the receptor and the turbine. By deactivating line-of-sight controls, the

²⁵ <https://www.edepositireland.ie/server/api/core/bitstreams/0c506e24-872f-4c90-882c-5ab61ac59c67/content>



model intentionally ignores any physical barriers that exist in the real world between the wind turbines and sensitive receptors.

Specifically, the model conservatively removes the following:

- Hills, ridges, or slopes that naturally block the view of the turbine.
- Houses, barns, or structures that cast their own shadows or block incoming light.
- Forests, dense tree lines, or hedgerows that screen the properties.

The resulting report will show the absolute maximum possible hours of shadow flicker. Because real-world barriers reduce shadow exposure, the actual shadow impact will be lower than what is included in the model.

3.17.2 *Shadow Flicker Mitigation*

Several concerns were raised surrounding the shadow flicker mitigation measures including 'near-zero' and concerns regarding reliance on automated software.

As described in EIAR Section 16.5.1, it is proposed that a shadow control system will be installed on each of the wind turbines that have the potential to cause shadow flicker for sensitive receptors. The control system will detect and calculate, in real-time:

- Whether shadow flicker has the potential to affect nearby properties, based on pre-programmed co-ordinates for the properties and turbines outlined in this assessment;
- Wind speed (can affect how fast the proposed turbine will turn and how quickly the flicker will occur); and
- The intensity of the sunlight.

When the sunlight is strong enough to cast a shadow, and the shadow falls on a property or properties, then the proposed turbine will automatically shut down; and will restart when the potential for shadow flicker ceases at the affected properties.

A shadow flicker control unit allows a wind farm's turbines to be programmed and controlled using the wind farm's SCADA control system to change a particular turbine's operating mode during certain conditions or times or even turn the turbine off if necessary. All predicted incidents of shadow flicker can be pre-programmed into the wind farm's control software. The wind farm turbines can be programmed to shut down any particular turbine at any particular time on any given day to ensure that shadow flicker occurrences at properties which are not naturally screened or cannot be screened with measures outlined above. Where such wind turbine control measures are to be utilised, they need only be implemented when the specific combined circumstances occur that are necessary to give rise to the shadow flicker effect in the first instance. Therefore, if the sun is not shining on a particular day that shadow flicker was predicted to occur at a nearby receptor, there would be no need to shut down the relevant turbines that would have given rise to the shadow flicker at the receptor. Similarly, if the wind speed was below the cut-in speed that caused the turbine rotor to rotate and give rise to a shadow flicker effect at a nearby receptor, there would be no need to shut down the relevant turbines that otherwise would have caused shadow flicker.

The atmospheric variables that determine whether shadow flicker will occur or not, will be continuously monitored at the wind farm site and the data fed into the wind farm's SCADA control system. The strength of direct sunlight is measured by way of photocells, and if the sunlight is of sufficient strength to cast a shadow, the shadow flicker control mechanisms come into effect. Wind speed and direction are measured by anemometers and wind vanes on each turbine and on the wind farm's met mast, and if wind speed and direction is such that a shadow will be cast, the shadow flicker control mechanisms come into effect. The moving blades of the turbine will require a short period of time to cease rotating and as such there may be a very short period (1-2 minutes (depending on site specific wind conditions)) during which the blades are slowed to a complete halt.

The Applicant will install a shadow flicker control system at turbines which have the potential to cause shadow flicker on nearby properties. This system will be installed prior to operation of turbines.

If there is sufficient existing screening at a shadow flicker receptor, the Turbine Shutdown Scheme may not be necessary for that receptor. The Applicant will engage with any affected residents to investigate options for new or additional screening measures (such as planting vegetation to act as a screen or installation of suitable window blinds in the affected rooms of the residence) where appropriate and agreeable to the affected residents. If screening is not acceptable and/or will not be effective the Turbine Shutdown scheme will be implemented to ensure 'near zero shadow flicker'.

The term 'near-zero' shadow flicker was used in Chapter 16 (Shadow Flicker) of the submitted EIAR to ensure full transparency. As soon as the correct set of parameters is in place for a potential occurrence of shadow flicker, the turbine would immediately undergo a stopping procedure. The time it takes for a wind turbine to safely stop spinning depends on several factors, including wind conditions, turbine size and braking systems. As mentioned in Section 16.5.1 of the submitted EIAR, this can take anywhere up to 1-2 minutes and will often take less time than that if the wind speed is not very strong. As discussed in EIAR Section 16.6 this would have an imperceptible long-term effect. Following the implementation of mitigation measures no significant effects are anticipated.

This form of mitigation represents sector-wide best practice and is widely implemented across the Irish wind energy industry, with automatic shadow flicker control systems routinely incorporated into turbine operational controls.

3.17.3 *Shadow Flicker Monitoring*

Several submissions asked that shadow flicker effects be independently monitored.

As stated within the EIAR in Section 16.5 the applicant will establish a formal system of engagement with local residents, including a point of contact for queries or concerns related to shadow flicker. All correspondence and follow-up actions will be monitored and recorded by the Applicant to ensure effective communication.

Where agreed screening measures are implemented, the effectiveness of the measures will be monitored. If these measures do not operate to the satisfaction of the property owner or occupant, the property will be incorporated into the Turbine Shutdown Scheme. If existing or

newly installed screening changes over time (or example due to damage, removal, or reduced effectiveness) ongoing engagement will continue between the Applicant, and the affected residents. In such circumstances, appropriate alternative or replacement mitigation measures will be agreed and implemented to ensure that shadow flicker remains fully mitigated and maintained at the 'near zero' standard.

All concerns raised will be investigated by the applicant and the turbine shutdown software adjusted as necessary, to ensure that the turbines shut down at the appropriate time. Following any software adjustments, flicker occurrence will continue to be monitored where residents report ongoing issues. This monitoring will help determine whether further refinements to the shutdown timings for any specific turbine are required.

3.17.4 Cumulative Shadow Flicker Assessment

Several submissions raised concern regarding the shadow flicker cumulative impact, noting the existence of other wind farms within the locality.

This is addressed within EIAR Section 16.7 of Chapter 16 (Shadow Flicker). Given that the Applicant has committed to near-zero shadow flicker for the proposed wind farm the contribution from the Proposed Project is considered negligible and would not result in any perceptible cumulative impact. Where Lacka wind farm is the closest operational development to the proposed wind farm, the Applicant will consider cumulative effects to the identified sensitive receptors within the 1.63km study area once the detailed specification of the chosen turbine model are confirmed at pre-construction stage. Again, as the Applicant has committed to near-zero shadow flicker, there will be no potential for cumulative impacts once the turbine shutdown scheme is installed. Any temporary turbine shutdowns required to achieve this outcome are subject to the technical capabilities of modern turbine control systems, which typically involve a controlled and safe slowdown of blade rotation lasting between one and two minutes. This operational measure would have an imperceptible long-term effect.

A submission was received in relation to Receptor 217. This receptor is located over 1.63 km from the proposed wind farm turbine locations. As mentioned in Section 16.2.2 of Chapter 16, the study area for shadow flicker effects (10 rotor diameters: 1.63km) is based on the WEDG 2006 guidelines which was also used for the assessment criteria in relation to maximum thresholds (30 hours per year and 30 minutes per day). All sensitive receptors falling outside the stated 1.63 km study area have not been included in the shadow flicker modelling.

3.17.5 Shadow Flicker Impacts on National School

Several submissions raised concerns surrounding the potential shadow flicker impacts on the local national school, Carrig National School.

Carrig National School is located 2km from a nearest turbine (T1) and over 1.63 km from the proposed wind farm. As mentioned in Section 16.2.2 of Chapter 16, the study area for shadow flicker effects (10 rotor diameters: 1.63km) is based on the WEDG 2006 guidelines which was also used for the assessment criteria in relation to maximum thresholds (30 hours per year and 30 minutes per day). All sensitive receptors falling outside the stated 1.63 km study area have not been included in the shadow flicker modelling.

Given the 2km distance of Carrig National School to the nearest turbine it is predicted that shadow flicker effects will be negligible. As the Applicant has committed to near-zero shadow flicker, there will be no potential for shadow flicker impacts once the turbine shutdown scheme is installed.

3.17.6 *Shadow Flicker Impacts on public health*

Several submissions raised concerns surrounding the potential for shadow flicker to adversely affect the health of vulnerable individuals, including those with epilepsy but widely affected by the following conditions:

- Photosensitive migraines
- Neurological conditions
- Tinnitus

Chapter 5 (Population and Human Health) of the EIAR provided an overview of relevant research, including a review of studies from Australia, Canada, the UK and other European countries. The research found that wind farms have no associated direct pathological effects on human health, and that any potential impact can be minimised by following planning guidelines. Notable studies discussed in Chapter 5 (Population and Human Health) of the EIAR include a 2014 meta study by Knopper *et al*, in 2014 and a study by Health Canada in 2014 which both found no links between wind farms and numerous health conditions. In addition to the above, a longitudinal study in Germany by Krekel *et al*. in 2025 found no evidence of negative effects on general, mental, or physical health, nor on doctor visits or suicide rates, in populations living near wind turbines²⁶. As outlined in Section 5.6.2 of Chapter 5 (Population and Human Health) of the EIAR, based on the literature reviewed, there is currently no reliable evidence to link wind turbines to adverse health impacts.

Also, as described in Chapter 5 (Population and Human Health) of the EIAR, the UK Wind Energy Guidance Note, prepared in the UK for the Renewables Advisory Board and Department for Business, Enterprise and Regulatory Reform (BERR) in 2007, addressed the question whether the shadow flicker from wind turbines can cause effects on human health. It was found that the frequency at which photosensitive epilepsy may be triggered generally is between 2.5 and 30 flashes per second (hertz). Most commercial wind turbines in the UK rotate at between 0.3 and 1.0 hertz, giving health effects arising from shadow flicker little potential to occur. The Proposed Project has committed to a near-zero shadow flicker (see EIAR Chapter 16 (Shadow Flicker)) which will eliminate that potential effect from dwellings in the surrounding areas through the use of screening measures and turbine control mechanisms.

²⁶ <https://cep.lse.ac.uk/pubs/download/dp1950.pdf>



3.18 TRAFFIC AND TRANSPORTATION – SUMMARY OF ISSUES RAISED

The submissions received from members of the public, schools, school transport operators, healthcare providers, haulage representatives and statutory and prescribed bodies raised a range of matters relating to traffic and transportation during the construction phase of the Proposed Project.

The principal matters raised related to:

- the proposed site entrances and available visibility;
- the suitability and condition of the existing road network;
- construction traffic volumes and network capacity;
- road safety and the protection of vulnerable road users;
- potential effects on schools, school transport, healthcare facilities, emergency services and agricultural activities;
- temporary road closures, diversions and maintenance of local access;
- construction of the Grid Connection Route;
- turbine component deliveries and other abnormal-load movements;
- road-condition monitoring, maintenance and reinstatement;
- consultation and advance notification; and
- potential cumulative traffic effects with other developments.

Transport Infrastructure Ireland, Offaly County Council and Tipperary County Council raised specific matters concerning the national, regional and local road network, including abnormal-load movements, construction haul routes, Grid Connection Route works, road reinstatement, visibility, road-condition surveys, temporary traffic management and protection of existing road infrastructure. The National Environmental Health Service confirmed that it was satisfied that the submitted TMP would provide adequate protection of public and environmental health, provided that the identified mitigation measures are implemented in full.

The traffic and transportation effects of the Proposed Project are assessed in Chapter 14: Traffic and Transportation of the EIAR. The assessment is supported by the Stage 1 Road Safety Audit included in Appendix 14-1 and the TMP included in Appendix 2-2.

Construction traffic, turbine deliveries and Grid Connection Route works will be managed through the implementation of the TMP. Before construction commences, the appointed contractor will develop the submitted TMP into a detailed construction-stage TMP incorporating the final construction programme, relevant planning conditions and traffic-management requirements agreed with Offaly County Council, Tipperary County Council, TII and An Garda Síochána, as appropriate.

The proposed measures include the use of approved construction haul routes, scheduling and coordination of HGV deliveries, restrictions during identified peak periods, advance warning signage, internal waiting areas, controlled HGV movements, maintenance of local and emergency access, road cleaning, advance notification and site-specific temporary traffic management where works interact with the public road.

Pre-construction and post-construction road-condition surveys will be undertaken along the agreed construction haul routes. The condition of the affected roads will also be monitored during construction, and any deterioration demonstrated to have resulted from the Proposed

Project will be repaired by the Applicant in consultation with the relevant Roads Authority. Grid Connection Route works and associated reinstatement will be undertaken in accordance with the applicable road-opening licences, the Guidelines for Managing Openings in Public Roads, relevant TII Publications and the requirements of the relevant Roads Authority.

Accordingly, the traffic and transportation matters raised in the submissions have been considered through the submitted assessment, project design and proposed mitigation measures. The assessment demonstrates that the temporary construction traffic associated with the Proposed Project can be accommodated on the identified road network, subject to the implementation of the TMP and the additional coordination and road-protection commitments identified in the preceding responses.

For ease of reference, the principal traffic and transportation topics raised, and the relevant submitted documentation are summarised in Table 3-2.

Table 3-2 Summary of traffic issues raised and relevant EIAR References

TOPIC RAISED IN SUBMISSIONS	SUMMARY OF ISSUES RAISED	RELEVANT EIAR REFERENCE
Site access arrangements and visibility	Concerns regarding the location and design of the R492 and L1071 entrances, available visibility, nearby bends and bridges, entrance geometry and the safe movement of construction vehicles.	EIAR Chapter 14, Sections 14.4, 14.9.1.3 and 14.9.1.4; Appendix 14-1, Stage 1 Road Safety Audit; Drawings 11333-2050 and 11333-2051
Suitability of the existing road network and construction haul routes	Concerns regarding the width, alignment and condition of the N62, R492, L1071 and adjoining roads, opportunities for HGVs to pass and the routes to be used by construction traffic.	EIAR Chapter 14, Sections 14.3, 14.5 and 14.8; Appendix 2-2, TMP
Construction traffic volumes and network capacity	Concerns regarding existing traffic levels, construction traffic generation, concrete deliveries, congestion, delays and the capacity of the N62/R492 crossroads and surrounding road network.	EIAR Chapter 14, Sections 14.3.3, 14.6, 14.7 and 14.8; Appendix 2-2, TMP
Road safety and vulnerable road users	Concerns regarding the interaction of construction traffic with pedestrians, cyclists, walkers, residents and other vulnerable road users, particularly on rural roads without footpaths or hard shoulders.	EIAR Chapter 14, Section 14.9; Appendix 14-1, Stage 1 Road Safety Audit; Appendix 2-2, TMP
Schools, school transport and student safety	Concerns regarding construction traffic during school arrival and collection periods, delays to school buses and traffic management near schools and school transport routes.	EIAR Chapter 14, Sections 14.8 and 14.9; Appendix 2-2, TMP

TOPIC RAISED IN SUBMISSIONS	SUMMARY OF ISSUES RAISED	RELEVANT EIAR REFERENCE
Road closures, diversions and local access	Concerns regarding temporary road and lane closures, diversion routes, delays and continued access to homes, farms, schools and businesses.	EIAR Chapter 14, Sections 14.8 and 14.9; Appendix 2-2, TMP
Emergency access, healthcare facilities and essential services	Concerns that construction traffic, road closures or temporary traffic management could delay emergency vehicles or affect access to healthcare and residential care facilities.	EIAR Chapter 14, Section 14.9; Appendix 2-2, TMP
Agricultural activities and farm access	Concerns regarding access to farms and fields, movement of livestock and agricultural machinery and the potential use of private entrances as passing or waiting areas.	EIAR Chapter 14, Section 14.9; Appendix 2-2, TMP
Grid Connection Route works	Concerns regarding trenching, road and lane closures, joint bays, temporary surfacing, property access, construction duration and permanent road reinstatement.	EIAR Chapter 14, Section 14.8.2.3 and Section 14.9; Appendix 2-2, TMP
Abnormal Indivisible Loads and turbine deliveries	Concerns regarding the transportation of turbine components, constrained junctions, swept-path assessment, temporary accommodation works, deliveries through Roscrea and the temporary delivery track at Sharavogue.	EIAR Chapter 14, Section 14.5; Turbine Delivery Route Assessment and associated swept-path drawings; Appendix 2-2, TMP
Permanent abnormal-load route modifications	Requests for temporary accommodation works required for turbine deliveries to be retained as permanent load-bearing infrastructure.	EIAR Chapter 14, Section 14.5; Turbine Delivery Route Assessment; Appendix 2-2, TMP
Road condition, maintenance and reinstatement	Concerns regarding deterioration of road surfaces, edges and verges, road-condition surveys, monitoring, repairs, wheel washing and temporary and permanent trench reinstatement.	EIAR Chapter 14, Sections 14.9.1.6 and 14.9.1.7; Appendix 2-2, TMP
Consultation, communication and advance notice	Requests for liaison with affected stakeholders and advance notification of construction activities, road closures, concrete pours and abnormal-load deliveries.	EIAR Chapter 14, Section 14.9; Appendix 2-2, TMP
Cumulative traffic and transportation effects	Concerns regarding potential overlap with Carrig Wind Farm, the Carrig grid	EIAR Chapter 14, Section 14.11; Appendix 2-2, TMP;

TOPIC RAISED IN SUBMISSIONS	SUMMARY OF ISSUES RAISED	RELEVANT EIAR REFERENCE
	connection and the Water Supply Project – Eastern and Midlands Region.	Section 3.18.2 of this submissions response
Statutory and prescribed-body submissions	Traffic and transportation matters raised by TII, Offaly County Council, Tipperary County Council and the National Environmental Health Service.	EIAR Chapter 14; Appendix 14-1, Stage 1 Road Safety Audit; Appendix 2-2, TMP; Section 23 and 2.4 of this submissions response

3.18.1 *Abnormal Indivisible Loads (AIL)*

Submissions raised concerns regarding the delivery of turbine blades and other large components and the potential disruption along the delivery route.

In response, a Turbine Delivery Route Assessment was undertaken for the entire route from Foynes to the site entrances. This assessment included swept path analysis at key junctions and constrained locations, which confirmed that turbine delivery vehicles can safely navigate the route and identified any localised temporary works required to facilitate deliveries.

Temporary measures such as localised hardstanding, temporary signage removal, and junction adjustments will facilitate the safe movement of turbine components where required.

Abnormal load deliveries will occur infrequently and under controlled conditions, during night-time periods, and will be accompanied by Garda escort and appropriate traffic management measures, thereby minimising disruption to the road network.

The design of temporary works required to facilitate turbine deliveries has also been reviewed as part of the Road Safety Audit process (EIAR Appendix 14-1) to ensure that the proposed measures can be implemented safely on the public road network.

3.18.1.1 *Potential Road Damage*

Some submissions raised concerns regarding the potential for construction traffic to damage local roads. In response, a pre-construction road condition survey will be undertaken along the construction haul routes prior to the commencement of works. A post-construction survey will also be undertaken following completion of construction.

Where any damage to the road network is identified as being attributable to construction traffic associated with the Proposed Project, this will be reinstated at the applicant's expense in agreement with the relevant local authority.

The management of construction traffic and road protection measures are set out in the TMP (EIAR Appendix 2-2).

3.18.2 *Cumulative Traffic Impacts*

The issue of interactions with other committed or permitted developments and potential effect on the road network was highlighted within some submissions. In response:

- The TTA follows TII PE-PDV-02045 guidance on cumulative (committed) developments. A 10 km planning search was completed to identify relevant developments (Chapter 1, Appendix 1-4).
- Cumulative construction traffic is low, with the largest developments generating minimal daily movements (e.g., 60 LV + 18 HV for WSP).
- Peak additional traffic from these developments is brief and imperceptible. Combined with Ballincor Wind Farm traffic, the cumulative effect on network performance is insignificant.

3.18.3 Road Closure

A submission was made by a nursing house in Shinrone in relation to road closures on the R492. There are no proposed road closures on the R492.

3.18.4 N52 Tullamore By-pass

A number of submissions were made in relation to the N52 Tullamore by-pass. While the observer makes a valid point in relation to the continued modification to the roundabouts, it should be noted it is not proposed to utilise the N52 Tullamore by-pass.

3.18.5 Conclusion

The traffic and transportation matters raised in the submissions from members of the public and statutory and prescribed bodies have been reviewed and addressed in the preceding sections.

The review confirms that the Traffic and Transport Assessment presented in Chapter 14 of the EIAR, together with the Stage 1 Road Safety Audit included in Appendix 14-1 and the TMP included in Appendix 2-2, provides a robust assessment of the traffic and transportation effects of the Proposed Project.

The additional clarifications and commitments presented in this submissions response reinforce the mitigation and traffic-management measures included in the planning application. These include construction delivery scheduling, use of approved haul routes, temporary traffic management, maintenance of local and emergency access, stakeholder liaison, road-condition monitoring and reinstatement, coordination of overlapping construction activities and compliance with the requirements of the relevant Roads Authorities.

Accordingly, the matters raised in the submissions do not alter the conclusions of Chapter 14 of the EIAR. Subject to implementation of the submitted TMP and the measures and commitments identified in this response, the temporary traffic and transportation effects associated with construction of the Proposed Project can be appropriately managed.

3.19 CONSTRUCTION PHASE GREENHOUSE GAS EMISSIONS

In relation to the greenhouse gas (GHG) emissions associated with the Proposed Project, these are presented in Section 17.7.2 of Chapter 17 Climate. The GHG emissions associated with the construction phase are predicted to be approximately 173 tonnes of CO₂e, while the GHG emissions savings achieved through the displacement electricity which otherwise would have been produced from fossil fuels are predicted to be 41,517 tonnes of CO₂e annually. Additionally, the loss of carbon sequestration through peat bog removal has also been quantified (approximately 75 tonnes of CO₂e) and accounted for in the total construction phase GHG emissions. The assessment clearly demonstrates the net GHG benefit of the Proposed

Project and that the project will result in substantial GHG emissions reduction relative to its construction phase emissions. Not significant benefits may occur in the form of peatland restoration, i.e. 5 ha as set out in EIAR Appendix 6-1 BEMP.

3.20 AIR QUALITY

Submission

Several submissions have raised concerns over potential air quality and nitrogen impacts during the construction works.

Response

Chapter 10 (Air Quality) of the EIAR assesses impacts of the Proposed Project with the potential for significant effects on air quality. These impacts include construction dust during the construction phase and the savings of nitrogen oxides (NO_x) emissions due to the displacement of power generation from fossil fuels by the renewable electricity produced by the Proposed Project. The assessment concluded that there are no significant effects on air quality associated with these impacts. There are no other impacts with the potential for significant effects on air quality associated with the Proposed Project.

3.20.1 Greenhouse gas (GHG) emissions and savings – operational phase

Submission

Concerns were raised in submissions regarding the carbon impact of the project over its lifetime.

Response

Construction related emissions are addressed above in section 3.19 of this report. Section 10.6 of Chapter 10 (Air Quality) of the EIAR assesses the on climate of the potential greenhouse gas (GHG) emissions during the construction, operational and decommissioning phases of the development (also known as a carbon balance assessment), as well as the offsetting of GHG emissions through renewable electricity generation, which will contribute to reducing national GHG emissions and Ireland's reliance on fossil fuels. The assessment considers the grid connection, which is required to deliver this renewable energy to the national grid and is therefore considered essential enabling infrastructure for renewable energy production.

The assessment focuses primarily on construction dust impacts associated with construction activities however there is an indirect improvement in air quality arising from reductions in nitrogen oxides (NO_x) emissions through the displacement of fossil fuel-based electricity generation by renewable electricity produced by the proposed wind farm. The assessment concludes that, with the implementation of appropriate mitigation measures, there will be no significant adverse effects on air quality during the construction, operational or decommissioning phases of the project.

The EIAR identifies the operation of the wind farm as having a positive effect on air quality through the displacement of conventional electricity generation. Based on the assessment, the proposed development is expected to generate a minimum of approximately 178 GWh of renewable electricity annually and to result in annual NO_x emission savings of approximately 74 tonnes, representing approximately 0.2% of Ireland's 2030 national NO_x emissions ceiling

and approximately 0.9% of NO_x emissions associated with power generation. This effect is assessed as indirect, long-term, positive and slight, and is not considered significant in EIA terms.

The methodology for quantification of GHG emissions associated with the Proposed Project is detailed in Sections 10.3. of Chapter 10 (Air Quality), and describes the sources of GHG emissions during the construction, operational and decommissioning phases of the Proposed Project. The primary sources of GHG emissions associated with the Proposed Project include:

- Materials required during the full construction period (such as concrete) and their associated transport, as well as construction staff transport. Details of vehicle movements are provided in Chapter 14 (Traffic and Transportation) and are incorporated into the GHG assessment as part of Chapter 10 (Air Quality).
- The GHG emissions associated with the manufacture of the wind turbines themselves have been considered in the GHG assessment as follows. Due to the flexibility sought regarding the range of design parameters associated with the wind turbines for the Proposed Project the make and manufacturer of the turbines to be installed has not yet been decided at this stage of the project and will be decided post consent should permission be granted. As a result, indicative information from Life Cycle Assessments (LCAs) from various wind turbine manufacturers (based on experience of similar projects and publicly available information from manufacturers such as Nordex and Vestas) has been considered in the GHG assessment.
- These LCAs are produced by the manufacturer at one specific site for specific turbine models, and consider variables such as project lifespan and local wind conditions. An LCA is not produced by the manufacturer on a project by project basis i.e. not for this Proposed Project. The GHG emissions are typically presented as an overall value, and detailed information for each stage is not provided. It is therefore not possible to extract only the relevant elements (such as materials for the turbines) for the Proposed Project and incorporate them quantitatively into this assessment. However, LCAs do provide an indication of the payback period for the turbines, which ranges from 5-8 months based on the LCAs reviewed. The Proposed Project is therefore expected to offset the GHG emissions associated with the turbine manufacture in a similar time frame. This has been considered qualitatively as part of GHG assessment for the Proposed Project.
- Changes to forestry area as part of site clearance and excavation works during construction. The total area of forest and the methods by which it will be affected are described in EIAR Appendix 2-3 and Appendix 2-8 and are incorporated into the GHG assessment as part of Chapter 10 (Climate).
- The GHG emissions associated with the construction and decommissioning phases are overall short term in nature, due to the length of the phases and the activities involved (e.g. material manufacture and site clearance).

The 61.6-77 MW capacity wind turbines assessed for the purposes of the GHG assessment will contribute to the Climate Action Plan 2025 (CAP25) key targets of producing 80% of energy from renewable sources by 2030. CAP25 is a statutory road map of actions necessary for Ireland to comply with legally binding economy-wide carbon budgets and sectoral GHG emissions ceilings. Without the actions identified by CAP25 (and future CAPs), Ireland will not meet its national climate objective of “*pursuing and achieving, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy*”. Decarbonising energy production will not be achieved by a single form of

renewable energy production, and will require a variety of technologies, including wind turbines and associated grid infrastructure. Meeting the 80% renewable energy production target will require at least 9 GW of onshore wind capacity, 8 GW of solar capacity, 5 GW of offshore wind capacity and 2 GW of new flexible gas plant. Onshore wind energy production and its associated grid infrastructure is a large component of meeting the 80% renewable energy target, and the proposed wind farm is therefore fully aligned with national climate policy.

The proposed wind farm will offset GHG emissions (both its own and total national emissions) during its operation. This offset is primarily due to the renewable electricity generated by the wind turbines over the 35 year lifespan of the proposed wind farm.

The GHG emissions offset from the operation of the wind turbines (approx. 41,512 tonnes of CO₂ equivalent (tCO₂e)) as well as the construction and decommissioning phase emissions (from materials, change in forestry area, site clearance and excavation and energy use) associated with the project (turbines and grid connection), and the alignment of the proposed wind farm with Ireland's trajectory to net zero by 2050 and CAP25 are taken into account in determining the significance of effect of the proposed wind farm on climate. The annual GHG operational emissions offset (which has taken the construction phase emissions into account) from the Proposed Project is equivalent to 1.8% of the total carbon budget for the electricity sector in 2030 i.e. the Proposed Project has the potential to reduce Ireland's GHG emissions in this sector by this percentage.

The proposed wind farm is therefore predicted to have a direct, long term, positive and slight effect on climate, which is overall not significant in Environmental Impact Assessment terms.

3.20.2 *Connection to the Environment*

Several submissions suggested that the presence of a wind farm would disconnect people in the area from nature and the local environment. The assertion that wind farms disconnect people from nature and the environment is not supported by research. On the contrary, multiple peer-reviewed studies demonstrate that wind farms do not inherently diminish people's connection to nature, and in many cases, they can actually enhance environmental awareness and place attachment. A number of publications relating to public and tourist perceptions of wind turbines were discussed in Chapter 5 (Population and Human Health) of the submitted EIAR. A number of additional studies are discussed in the following paragraphs.

A comprehensive study by Penneman *et al.* (2022) examining public opinion on Belgium's offshore wind farms found that acceptance increased markedly after turbines became operational²⁷. This research documented a significant shift from pre-construction scepticism to post-construction acceptance, suggesting that direct experience with wind farms actually strengthens rather than weakens people's relationship with their environment.

Frantál *et al.* (2017) conducted on-site evaluations at Iceland's proposed Búrfell wind farm and found that perceived compatibility between turbines and landscape was the dominant predictor of acceptance²⁸. Importantly, the study showed that turbines could coexist with perceptions of beauty and wildness, directly contradicting claims of environmental disconnection. Participants

²⁷ <https://doi.org/10.1080/09640568.2022.2079078>

²⁸ <https://doi.org/10.1515/MGR-2017-0020>

who viewed the landscape as open and resilient were more likely to accept turbines as compatible with the natural setting.

López-Martínez's (2023) analysis of Spanish Mediterranean landscapes found that wind turbines were not generally perceived negatively, and in some degraded landscapes, turbines actually improved scenic ratings²⁹. This research demonstrates that turbines can enhance rather than detract from landscape aesthetics, particularly when carefully integrated into the environment.

3.21 I-LOFAR

Submission

A number of similar submissions were made by TUS, DIAS, Galway University and Trinity in relation to the location of the proposed turbines in relation to the I-LOFAR.

Response

Consultation was issued to the main contact details (as detailed in Appendix 1-3) for the I-LOFAR in July 2024 and July 2025, however no response was received. It is noted in the TUS submission that engagement had occurred, however this was in relation to a separate project and does not relate to the application under consideration. In relation to the submission it is noted that there are existing granted turbines within 5 km of the I-Lofar site. In total 10 of the 11 turbines are >5km from the I-Lofar site.

The Low Frequency Array (LOFAR) is an international network of telescopes used to observe the Universe at low radio frequencies. LOFAR consists of 12 international stations spread across Germany, Poland, France, UK, Sweden and Ireland, with additional stations and a central hub in The Netherlands, operated by the Netherlands Institute for Radio Astronomy. There are a number of windfarms were constructed near Lofar sites in Europe. For example, The Drentse Monden en Oostermoer Wind farm³⁰ was constructed between 3.5 and 7 km from the 23 unit Lofar array near Groningen, the Netherlands. The Drentse Monden en Oostermoer wind farm comprises 40 Nordex N131/3900 have a hub height of 145 m and tip height of 210 m with a MEC of 156MW. As is stated in the Trinity College submission, 'MEC between a wind farm and a radio telescope has been successfully achieved at the LOFAR core at Dwingeloo in the Netherlands where, through careful design of all aspects of the turbines used, coexistence has been possible'.

I-LOFAR is the Irish addition to this network and is located west of Birr, County Offaly. Cush wind farm located <5 km from I-Lofar was granted permission on the 04/11/2024. Lacka and Skehanagh wind farms are located 6 and 7 km to the south and on the same alignment as the proposed windfarm and at similar elevations.

Pager Power have been commissioned to review the Technological University of the Shannon (TUS) response to An Coimisiún Pleanála regarding Ballincor Wind Farm. The TUS response focuses on the potential impact of the proposed development on the Irish Low Frequency Array (I-LOFAR) radio telescope at Birr Castle Demesne, Co. Offaly. Michael Sutton from Pager power

²⁹ <https://doi.org/10.1007/s10980-023-01698-8>

³⁰ <https://ventolines.nl/en/project/wind-farm-de-drentse-monden-oostermoer/>

had assessed numerous wind farms in terms of EMF, Radar and Navigation Aid Impacts and Radio Telescopes including the permitted Cush Wind Farm, Co. Offaly.

TUS propose that the appropriate course is for the Commission either to require the applicant to furnish a proper assessment of effects on I-LOFAR, or to grant permission subject to binding, enforceable conditions for which they have suggested wording. They claim that these conditions are directed at securing electromagnetic compatibility in advance of construction and would allow the development to proceed compatibly with the continued operation of I-LOFAR.

The analysis presented in the following subsections is based on first principles and typical safeguarding processes for radio equipment. The operational considerations around astronomy using such telescopes is complex, highly specialised and evolutionary.

Electromagnetic Compatibility

It is expected that all electrical equipment associated with the proposed development will be CE marked, indicating that it has been assessed by the manufacturer and deemed to meet European Union safety, health and environmental protection requirements. In this case, the relevant EU Directive for CE marking is Electromagnetic Compatibility Directive 2014/30/EU which ensures that electrical and electronic equipment does not generate, or is not affected by, electromagnetic disturbance. It is understood that this directive was written into Irish law in 2016.

Given the above, any electric and magnetic emissions from the turbines will be insignificant at the I-LOFAR site. This is because the emissions are small, due to their compliance with International Electrotechnical Commission standards, and because they reduce significantly with distance (the separation distance is 4.96 kilometres at minimum).

EMF emissions from the turbines will therefore be significantly smaller than emissions from closer sources, such as vehicles, mobile phones, buildings, machinery, home appliances, etc. in and around Birr. The lowest levels of man-made electromagnetic fields (EMF) in Ireland are encountered in Zone D (Rural Ireland), specifically within deep wilderness regions, national parks, and offshore islands³¹.

Furthermore, the telescope site is a single remote node which is part of a large European telescope, with its main receiver site located in the Netherlands. This means that any interference that affects just one node, without affecting the core telescope site, is likely to be weighted and potentially filtered out when received signals from multiple sites are combined and processed.

Line of Sight Analysis

The wind turbines will be within line of sight to the I-LOFAR antennae. The effect on the unobstructed horizon due to the turbines has been assessed by assessing the increase in elevation angle to the turbine tips, compared to the terrain at the horizon.

The elevation angle to the turbine tip ranges from approximately 1.18 degrees to 2.04 degrees. This is an increase of approximately 0.5 to 1.8 degrees compared to the current maximum obscuration from the terrain. The obscuration of the horizon due to the proposed development

³¹ <https://www.epa.ie/environment-and-you/radiation/emf/emf-monitoring-programme/rf-emf-monitoring-programme/>

is not predicted to be a significant issue for the I-LOFAR. There is no visibility below 5 degrees due to the intervening vegetation.

Reflection Issue

Existing terrestrial sources of radio emissions produce interference, or 'noise', which in some cases is detected by I-LOFAR. For the purposes of the proposed development, radio signals from a transmitting location in Kilduff, County Tipperary are considered to be the most significant noise source.

Based on Pager Power's previous experience with calculations carried out for the Kilduff transmitter, there could be an increase in noise due to reflections from the proposed development, however, particularly in the frequency range the I-LOFAR is designed to detect, the increase is predicted to be negligible. No issues with regard to reflection of wanted signals are anticipated

Commentary on Conditions

It is considered that the proposed development will be compliant with the relevant Electromagnetic Compatibility directives by design, and therefore conditions 1 to 3 could be replaced with one planning condition to secure all equipment according to the relevant EU Directive for CE marking is Electromagnetic Compatibility Directive 2014/30/EU. Condition 4 focuses on the main technical concerns (radio-frequency-interference) and proposes the undertaking of a baseline survey, monitoring programme and remediation mechanism. This appears reasonable from a technical perspective, given that the proposed turbines will be within line of sight to the I-LOFAR antennae. The point of contention is potentially that condition 4 could also replace conditions 1, 2, 3 and 5 on the basis that the developer is free to implement any equipment they wish as long as it does not interfere with the I-LOFAR. Having this condition as well as the previous conditions to ensure the I-LOFAR is adequately protected could be considered unnecessary.

Based on Pager Power's professional opinion and experience of issues faced by radio telescopes, Condition 5 (Scattering assessment) is reasonable from a technical perspective, however, it is likely to conclude that there is no more than a low (and not significant) potential for scattering of terrestrial transmissions from turbine structures into I-LOFAR. Therefore, as mentioned above, this could be integrated into Condition 4, or the condition could be discarded entirely.

Condition 6 (Liaison and enforcement) is reasonable, as it would ensure that any mitigation obligations and agreements remain enforceable throughout the lifetime of the proposed development.

3.21.1 *Conclusion*

While no correspondence was received from I-LOFAR representatives during the consultation process for the Proposed Project, the conditions as suggested by TUS were assessed along with an overview provided by Pager Power as part of this response. The submission from TUS appears to be reasonable, with willingness for the proposed project and the I-LOFAR infrastructure to co-exist. The issues identified are typical for radio telescopes.

3.22 AVIATION

Summary

A number of submissions were made in relation to the Ormand Flying Club in Birr and Shannon Airport. A number of concerns were raised in relation to consultation and training flight routes at Birr Airfield.

Response

Ai Bridges Ltd were commissioned to review the possible impacts of the proposed wind farm on aviation systems in the vicinity of the proposed wind farm development at Ballincor, Co Offaly. Further details are provided in Chapter 15 Material Assets, Telecommunications and Aviation and Appendix 15-2, which were submitted with the EIAR.

Annex 14 - Obstacles Limitation Surfaces (OLS)

A review shows that the proposed wind farm will be located outside the Outer Horizontal Surface of the Shannon Runway Obstacle Limitation Surfaces (OLS), as defined in ICAO (International Civil Aviation Organization) Annex 14.

As the proposed wind farm is situated outside the Outer Horizontal Surface and there is no penetration of the take-off or approach surfaces, it is unlikely that there will be any impacts to the OLS surfaces for Shannon Airport.

Irish Air Corps / Department of Defence (DoD) Safeguarding

The Irish Air Corps position on wind farms / tall structures are outlined in the paper which was published in 2014: “*Air Corps Wind Farm/ Tall Structures Position Paper*”. In the position paper the Irish Air Corps outlines restricted areas where they would object to the installation of wind turbines /tall structures. The areas defined by the Air Corps have been mapped and analysis shows that the proposed wind farm site is located outside the restricted areas. As the proposed wind farm is not located in a restricted area it should have no impacts on the Irish Air Corps activities.

Birr Airfield

The nearest airfield of the proposed turbines at Ballincor would be 3.9 km i.e. Birr Airfield. The airfield is a privately owned airfield with a grass-strip runway. The airfield is licensed with the IAA but has a relatively small runway (Code 1) and operates in Class G uncontrolled airspace under VFR (Visual Flight Rules) only. For licensed code1 runways, a 2.7 km Obstacle Free Zone around the runway should be observed. The proposed turbines would not penetrate this zone and would have no impact to flights to/from the airfield.

It should also be noted that the Irish Skydiving Club also conduct occasional parachute drops at this airfield. The landing area designated by a parachute center for a parachutist to land on is usually known as the Drop zone (DZ). In Ireland, the DZ is not regulated by the IAA (Ref. *IAA – Information for Persons engaged in Parachuting in Ireland*), however the Civil Aviation Authority (CAA) states that a Drop Zone should be at least 2.8 km from the center of the Parachute Landing Area. The proposed turbines would not penetrate this zone and would have no impact to aviation activity in the airfield (i.e. including parachute drops).

The operator of Birr Airfield (Ormand Flying Club Ltd) was also contacted regarding proposed development, on 1st May 2020 and again on the 4th July 2024. Locations of potential turbines were provided in 2024. No response was received from Ormand Flying Club to either of the consultation requests.

3.23 FIRE RISK / EMERGENCY RESPONSE PLAN

Concerns regarding fire risk, structural failure and emergency response capability in a remote rural location, or the implications for nearby land, livestock, and dwellings were raised.

The risk of fire on site through causes such as wildfires and lightning strikes is discussed in EIAR Chapter 18 (Major Accidents and Natural Disasters). These are considered to have a low potential for risk to the Proposed Project, which are overall not significant.

EIAR Appendix 2-3 presents the project Construction Environmental Management Plan (CEMP). This CEMP is a live document and will be reviewed and updated, as necessary to incorporate any planning conditions. Upon appointment, the Contractor for construction of the Proposed Project shall update this document to produce an updated version of the CEMP (i.e. the Contractor's CEMP) which will account for any additional requirements set out in planning conditions. A Fire Risk assessment for the BESS was submitted in Appendix 2-7.

Section 6 of the CEMP defines the project Environmental Emergency Response Plan / Procedures for the project including for fires, structure failures, spillages etc. It also includes details of procedures for site induction training, fire drills and site evacuations, spillage response and controls, emergency contact details and communication procedures in the case of incidents. As mentioned above, the appointed Contractor will update this Environmental Emergency Response Plan within the CEMP which will be active prior to construction works commencing on site and will form part of staff inductions.

3.24 THIRD PARTY SUBMISSION - INADEQUATE AND FRAGMENTED PROJECT DESCRIPTION

The Greater Birr Wind Action group raised a concern regarding an inadequate and fragmented project description which describes the development through fragmented elements spread across multiple chapters, appendices, parallel applications, and future consents. That submission also states that the substation layout is described as conceptual and includes provisions for future expansions meaning the full scale and long-term extent of the infrastructure is not fixed or fully assessed at application stage.

In response, the description of the Proposed Project is detailed in EIAR Chapter 2 (Description of Proposed Project), the Statutory notices and Planning Statement. In relation to the substation having an area for future expansion; this is correct as it is an EirGrid requirement to include this as part of the standard design layout. The substation layout has been designed to fully comply with EirGrid's requirements for 110kV substations and has been assessed throughout the EIAR. It is also confirmed that this project application includes for a BESS development and was provided in the EIAR.

3.25 SIZE AND LOCATION OF TURBINES IN RELATION TO NEIGHBOURING WIND FARMS

Several submissions consider that the proposed wind turbines are inappropriate due to their scale, location within the community and proximity to residential properties.

In response, as noted in EIAR Chapter 2 (Description of the Proposed Project), the 11 no. wind turbines proposed on site will have a maximum blade tip height range from 179.5 m and 180 m inclusive, a rotor diameter range from 149 m - 163 m inclusive, and a hub height range from 98.5

m - 105 m inclusive. These are the dimensions of turbines currently available on the procurement market.

Since Lacka were constructed (more than 10 years ago), turbine technology has advanced. Turbine heights in Ireland have increased significantly, with onshore structures now often reaching over 180 m, driven by the need for higher energy output, better efficiency, land availability and the limitations of older technology. Taller turbine towers replace aging technology to capture smoother wind called laminar flow, utilising stronger and more reliable winds to significantly increase power output. More efficient larger towers also reduce the number of turbines needed on site to produce the same amount of electricity.

During the design of the proposed Ballincor Wind Farm site layout, environmental constraints (including proximity to residential developments and neighbouring wind farm turbines) and technical constraints were considered (see EIAR Chapter 3 (Consideration of Reasonable Alternatives) which discusses the alternative layouts and designs considered). Along with adherence to legislation and guidance for wind farms as discussed in EIAR Chapter 4 (Policy, Planning and Development Context), these constraints informed the final site design and the positioning of turbines on site. It is of note that all turbines are positioned at a minimum of 720 m from residential properties (four times the maximum 180 m tip height, in compliance with the Draft Revised Wind Energy Development Guidelines (2019)), except for the property where an option agreement has been entered into with the landowner agreeing not to object to the development and required to sell the property if planning permission is granted (see Section 2.1.2.3)

It is acknowledged that wind energy developments are an existing part of the wider landscape. As noted within the EIAR, the Lacka Wind Farm are located west of the proposed wind farm site approximately 1.7 km from proposed turbine T3.

Wind energy developments are present in this part of the country as this part of County Tipperary has a known wind resource suitable for wind farm developments.

As noted in EIAR Chapter 3 (Consideration of Reasonable Alternatives), the Wind Atlas mean wind speed was determined for the proposed wind farm site and was considered to be suitable in the context of operational efficiency and the nature of modern-day turbine technology.

Wind energy developments in the area were cumulatively assessed as part of the EIAR assessments (see EIAR Section 1.8 and Figure 1-3) and no likely significant effects were noted.

3.25.1 Distance to Dwellings

Several submissions raised concerns with the distances from the proposed wind farm site, and more specifically from the wind turbines themselves to various dwellings in the surrounding area. In response, the current Wind Energy Guidelines 2006 require a setback of 500 m from turbines to residential properties. The proposed design exceeds current requirements by adhering to the Draft Revised Wind Energy Development Guidelines (2019). Specifically, it incorporates a greater setback distance of a minimum of 720 m between turbines and residential dwellings except for the property of an involved landowner.

3.25.2 Ice falling from turbine blades

Ice fall from turbines was raised as a concern in some submissions. EIAR Chapter 18 (Major Accidents and Natural Disasters) considers the potential for ice fall from the turbine blades, see

EIAR Table 18-5. As noted in Table 18-5 the Draft 2019 Wind Energy Development Guidelines refer to the very remote possibility of injury to people (or animals) from flying fragments of ice or from a damaged blade but notes that most blades are composite structures with no bolts or separate components and that most turbines are fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades and prevent start-up.

Also modern wind turbine generators have incorporated advanced blade anti-icing solutions to their design. There are several methods and technologies currently available on the market.

Examples of these include:

- Blade heating solutions- this is the most common method currently. This method blows warm air down the interior of the blade to prevent ice forming, even during operation.
- Surface heating elements- Thin, carbon-fibre heating layers are embedded under the blade surface for fast, targeted, and long-lasting ice protection.
- Ice detection solutions – this uses a combination of temperature, humidity, air flow sensors, anemometers, cameras, and measurements to detect performance changes. Automated systems detect ice accumulation and, when necessary, shut down turbines to prevent damage or dangerous ice throw.
- Anti-ice coatings- While not a total anti-icing solution, this coating repels waterdrops significantly reduces ice adhesion. By allowing ice to "shed" more frequently in smaller amounts, it prevents heavy accumulation and grants crews a critical window to assess potential shutdowns. Furthermore, it enhances safety by ensuring ice is released before it becomes large enough to pose a hazardous "ice throw" risk.

The specific turbine model to be used for the Ballincor Wind Farm is currently unknown and will be procured post planning. The applicant is committed to selecting a turbine model which incorporates an anti-icing solution as part of their design. The applicant would accept this as a condition of planning, should planning permission be granted.

3.26 DISPROPORTIONATE CONTRIBUTION TO NATIONAL TARGETS FROM RURAL AREAS

A number of submissions note that the local area and other areas in County Offaly and Tipperary already have wind energy developments and that there seems to be a disproportionate contribution to the national targets from County Offaly and Tipperary.

In response, not all areas in Ireland are suitable for wind energy development. The same can be said for other renewable technologies such as solar energy. Even those areas that are considered suitable for wind energy, may have environmental or technical constraints when further studied which deem them not feasible for development. As discussed in EIAR Chapter 3 (Consideration of Reasonable Alternatives), the project area in County Offaly and Tipperary is recognised as having a suitable wind resource for wind farm development. This is the reason why wind energy developments form part of the wider landscape.

The Sustainable Energy Authority of Ireland (SEAI) have produced a Wind Atlas which is a digital map of Ireland's wind energy resources. It provides detailed information on wind speeds in Ireland. This information is used in assessing the suitability of wind resources in specific areas.

SEAI state “*the goal of this map is to aid policy makers, local governments and community groups in the initial planning stages*”³². This approach ensures optimal utilization of available data to maximize Ireland’s wind energy yield.

A wind speed above 7 m/s at turbine hub height is normally the minimum speed required for economic development³³. The 2013 SEAI Wind Speed Atlas identifies the proposed wind farm site as having a wind speed of between 7.4 m/s and 7.5 m/s at 100 m above ground level, identifying the site as a candidate for wind energy as detailed in Chapter 2, Section 2.5 of the EIAR.

3.26.1 Construction Phase Impacts - Duration, Intensity and Disruption

Potential impacts during the construction phase are a concern within some submissions particularly regarding noise, traffic and work hours (early starts). In response, construction phase impacts have been fully assessed throughout the EIAR including the noise and traffic chapters. A Construction Environmental Management Plan (CEMP) has also been developed (EIAR Appendix 2-3) which sets out the standard working hours for the site, the procedures for staff, best practice environmental protection measures and mitigation measures to be followed to ensure any potential impacts are eliminated or reduced. The CEMP is a live document and will be updated accordingly prior to works commencing to include any planning conditions relevant to the construction phase.

3.27 LAND SOILS AND GEOLOGY

A number of submissions were made in relation to Meenbog bog. The Ballincor site is located in a lowland area of drained peatland and the risk is negligible residual in terms of peat stability. This is confirmed by site investigation data and Appendix 8-2 PSRA.

3.27.1 Peat Volumes

A number of queries were raised in relation to peat volumes. The total volume of peat for excavation is 59,000 m³. The volume summary for peat and soil excavation is 87,600 m³.

3.27.2 Construction

A number of submissions were made in relation to the construction of T4 and T9. The proposed design as set out in Section 8.4.2 and outlines the use of piling at the relevant locations. The PSRA – Appendix 8-2 sets out the measures required to ensure stability. One submission raised concern in relation to groundwater flow at T4.

As outlined in the PSRA, during the geotechnical investigation by trial pits, sidewall collapse or spalling was encountered in 9 of the 12 trial pits where peat was present. This suggests that peat excavations at the site will likely be unstable in the short term and the likelihood of an excavation collapsing during construction is generally in the range “likely” to “probable” in the absence of mitigation. Side wall collapse or short terms stability is expected in the trial pits. Mitigation measures will be put in place during the design and construction of the scheme to

³² <https://www.seai.ie/renewable-energy/wind-energy/wind-atlas-map>

³³ <https://teagasc.ie/rural-economy/rural-development/diversification/wind-energy/#:~:text=In%20Ireland%2C%20the%20average%20wind,speed%20required%20for%20economic%20development.>

stabilise the excavation. Mitigation measures include stepping or battering back of excavations to a safe angle (as determined through a slope stability assessment by a competent temporary works designer) or construction of a temporary sheet pile wall or rock fill berm to support the peat during construction. Sheet piling will be utilised for T4, T8 and T9.

The foundations at T4 are located within the cutover bog and underlain by deep clayey till subsoil materials. Due to the presence of the extensive drainage at T4 and the proposed SuDS, drainage around the turbine will be maintained at existing levels.

3.27.3 *Soil carbon and Cutover peat*

A number of submissions were raised in relation to the release of carbon from peat soils and construction on cutover peat.

The proposed wind site is partially located on an area of drained peat. There are no areas of active peat within the proposed wind farm footprint. Water levels vary but are generally >0.3 m to 1 m below ground level and used for agriculture/forest there are not likely to become sinks. As set out in Appendix 6-1 BEMP 'The cutover peatland habitats are subject to recent and continued turbary activity and are dominated by bare peat. They do not correspond to any Annex I peatland habitats.

It is proposed to enhance approximately 5 ha of the raised bog habitat within the proposed wind farm site, post construction. The restoration will follow 'Best Practice in Raised Bog Restoration in Ireland' (Mackin et al., 2017)'.

Rewetting of 5 hectares of peatland reduces annual carbon losses by 0.59 to 2.17 tonnes of carbon per hectare (Aitova et al 2025)³⁴. Furthermore c.3 ha of turbary will not be cut when compared to a do-nothing/future baseline environment. While the rates of carbon capture/offsetting is low compared to the proposed wind turbines, it is a small contribution within an overall targets.

Cutover peat is identified on the proposed wind farm site. Peat excavated will be reused on site. Currently the cutover peatlands are utilised for agriculture or turf cutting. The proposed wind farm will remove/reduce these activities within the turbary area and farmland.

The raised bog would continue to be actively cut as per the existing turbary activities in place, while in some drier areas of the peatland habitat, scrub is likely to develop and in time, this may undergo succession to woodland. A Biodiversity Enhancement Plan is included in Appendix 6-1.

The cutover bog peatland habitats within and surrounding the proposed wind farm footprint are degraded and do not support active peat formation as the habitats are extensively drained. The cutover peatland habitats are subject to recent and continued turbary activity and are dominated by bare peat. They do not correspond to any Annex I peatland habitats.

It is proposed to enhance approximately 5 ha of the raised bog habitat within the proposed wind farm site, post construction. The restoration will follow 'Best Practice in Raised Bog Restoration in Ireland' (Mackin et al., 2017)

The main measures for restoration of peat forming conditions are:

- Drain blocking

³⁴ Aitova, E., Renou-Wilson, F., Wilson, D., Crowley, W. and Morley, T.R., 2025. Immediate impact of rewetting on carbon dynamics in a degraded Irish raised bog. *Land*, 14(11).

- Removal of encroaching trees/scrub
- Inoculation with Sphagnum sp
- Excavation/reprofiling
- Bunding on high bog

For the peat deposition area and borrow pits, turves of the surface vegetation will be retained and will be emplaced on top of the peat repository areas in order to retain and translocate existing cutover community habitats and reduce run-off potential from these areas. These repository areas will be left to naturally recolonise.

3.28 HYDROLOGY AND HYDROGEOLOGY

3.28.1 *Hydrogeology connection and Sharavogue bog*

A number of objections stated that a mapped gravel-and-esker "window" lying inside the red line that the applicant has drawn around and excluded. It is not clear what is meant by this. The Esker and gravel area within the proposed windfarm was avoided by the proposed design. Irrespectively the gravel and esker system is unconfined and discharges locally to the onsite drains to the local streams including the Kylenamuck stream. There is no wind farm works with the esker gravels location within the overall application. Lands underlain by the esker gravels will remain in agricultural use. Groundwater monitoring was undertaken on the proposed wind farm site and all groundwater levels were >0.3m below ground level. No active or peat forming peat was encountered within the proposed footprint, likely as a result of the extensive drainage and historical turf cutting. .

In terms of dewatering, a number of submissions focused on T8 and T9 due to the proximity of the Sharavogue Bog. As is outlined in the EIAR, T8 and T9 are located on a drained grassland to the west of the Little Brosna. The turbines are underlain by drained cutover peats and deep alluvial soils. The underlying silts are low permeability and any dewatering relates to the already drained peat soils.

Sharavogue Bog SAC is located to the east of the River Brosna. A summary of the distances to the Sharavogue Bog SAC and associated habitats are included in Table 3-3 below.

Table 3-3 Summary of distances to Sharavogue bog habitats

Turbine	Distance River	Peatland habitats	Lagg fen area
T8	84m	266m to marginal /face bank ecotope. 350 m to active bog area.	850 m to Lagg area. The lagg is located at higher elevation than T8/T9 and the Little Brosna River. Ground water upwells at 48-52mOD and located between the elevated limestone tills at Rathbeg and Sharavogue bog.
T9	108m	311m to marginal /face bank ecotope. >350 m to active bog area.	910 m to lagg area. Lagg is located at higher elevation than T8/T9 (45mOD) and the Little Brosna River. Ground water upwells between 48-52mOD and located between the elevated limestone tills at Rathbeg and Sharavogue bog.

3.28.1.1 Distance to River /Peatland SAC

A number of submissions were made in relation to the distance of T8 and T9 to the Little Brosna. The distance from T8 and T9 from the Little Brosna is 84m and 108 m from the Little Brosna. The distance to the active bog (subcentral ecotope) area in Sharavogue is 350 m, as mapped by the NPWS. The distance to the lagg/fen areas within the Sharavogue Bog SAC is 850 m - 910 m. The distance from Peat Deposition Area 1 is 170 m to the North Cloonaheen stream.

The proposed boundary is 10 m from the SAC however the red line does not represent the area of development. The distances from turbines to the SAC and QI habitats is set out in the above paragraph.

3.28.2 Flooding

A number of submission relate to flooding and in particular Turbines T1, T2, T8 and T9 hardstands which are partially located in Flood Zone A/B. T9's hardstand is 50% inundated in a 1-in-100 year event. This is acknowledged in the Flood Risk Assessment for the applicant. It is stated that the same flood events that inundate these structures will overwhelm the sediment and pollution control measures upon which the entire WFD compliance case rests. Similarly, the NIS conclusion of no adverse effect on the integrity of downstream European sites (Shannon Callows SAC, Little Brosna Callows SPA, Dovegrove Callows SPA, Middle Shannon Callows SPA, Lough Derg SPA) rests entirely on mitigation measures that cannot function during the flood events already shown to affect the site. A submission was made in relation to the flooding along the access road.

Response:

The Applicant acknowledges that the recorded flood event in 2025 resulted in flooding across parts of the site and that the modelled flood extents indicate inundation of certain sections of the proposed access track network. Flood levels in November 2025 were at the highest levels recorded at Croghan Bridge gauging station.

The proposed access roads will be constructed above the existing ground level. As a result, although the current flood mapping shows inundation across the existing terrain, the completed road surfaces are not expected to be inundated during the equivalent design flood events assessed.

The introduction of raised access tracks will result in a localised loss of floodplain storage. This loss has been more than compensated for through the provision of dedicated flood compensation storage areas within the site design. The proposed compensation storage volume exceeds the volume displaced by the raised infrastructure, ensuring that there is no net loss of floodplain storage and no adverse impact on flood risk elsewhere.

As stated in the FRA, over 14,000 m³ of additional flood compensation will be created by the proposed wind farm which will mitigate any loss on the proposed wind farm site. The route of the road follows an route along the flood plain which has been elevated due to placement of historical drainage. The river is still connected to its floodplain with additional flood capacity to be provided.

In addition, the section of access track identified as the T9 Southwards Road is required on a temporary basis only to facilitate construction activities. The proposed route is located on a raised area above the surrounding floodplain due to the maintenance of the existing drain. The

route aims to maximise the distance to the Little Brosna with frequent culverts to allow for the free movement of water onto lands to the west of the access road. Upon completion of its intended use, this temporary road will be reduced in level and the area will be reinstated to its original ground levels as stated in Chapter 2 - Project Description. Consequently, this section of track will not result in any permanent loss of floodplain storage.

Based on the above, while the existing flood extents indicate flooding of portions of the current ground surface, the proposed permanent access roads are expected to remain above flood levels, and appropriate flood compensation measures have been incorporated to ensure that the development does not increase flood risk or reduce overall floodplain storage capacity.

All construction works are connected to surface water or groundwater pathways. The proposed turbines are hydrologically connected to the surface water regime however with the implementation of mitigation measures the risk is reduced. Construction works on site would be curtailed in the event of flooding.

The settlement ponds are likely to create some wetland areas with the flood compensation area providing a wet grassland/pond area. The flood compensation area will be approximately 1.3 ha in area. An area adjacent to the substation will be designated for flood compensation measures. This will have a dual function for biodiversity as it will also act as an ephemeral pond. The base will not be lined, which will result in the water level rising and falling depending on weather conditions. The advantage of ephemeral ponds is that frog spawn will have a chance to mature.

In time, areas that are rewetting are likely to transition to mires, overall, 'Ireland could have an area of potential natural mires greater than in any other European country at these latitude' (Wilson, 2011).

Settlement ponds slow down floodwaters, causing sediment and the nutrients attached to it (like phosphorus and nitrogen) to settle out. Research on the Rhine River floodplains indicates that restoring ponds and reedbeds is particularly beneficial for phosphorus retention, making them more effective than woodlands or grasslands for this purpose.

During a flood event, the floodplain acts as a massive filter and temporary storage zone for sediment carried by the river. Plants act as physical barriers, slowing the water further and trapping fine sediment. The roadside swale will be vegetated in accordance with SuDS principles. Many wetland habitats are dependent on continual or periodic flooding for their sustainability and can contribute to the storage of flood waters to reduce flood risk elsewhere.

3.28.3 *WFD status*

Submission:

A number of comments were made in relation to an error included in Chapter 9 Hydrology and Hydrogeology in relation to the WFD Status of the Little Brosna.

Response:

The status of the Little Brosna is poor under the 2019-2024 rather than moderate. The WFD status for the Little Brosna was changed from Moderate (2016-2021) to Poor (2019-2024) in Oct 2025. The status is correctly stated in the WFD assessment. Based on site monitoring on the River Brosna, water quality is variable and ranges poor to moderate however the status is set on a river basin scale. Brown trout were the most common and abundant species throughout the catchment with low number of salmon. A fish ecological status of 'Moderate' was assigned

to the Little Brosna_040 based on the stock assessment results. While the stream is at poor status, the status of the river basin reflects the existing environment and is not related to the proposed wind farm.

The status of the Little Brosna is assessed on a river subbasin basis and generally based on one location. The relevant location for the Little Brosna_040 is Riverstown bridge. This classification then applied to all streams within the Subbasin. Water quality can change dramatically from one stream section to another. Research shows that for many pollutants, the differences between locations are actually larger than the changes at a single location over time³⁵.

The submission references the Weser judgement. The Weser judgement states that if a quality element is already in its lowest class, any further deterioration is prohibited. The proposed wind farm as assessed will not result in a deterioration of the water quality.

The proposed wind farm proposes extensive areas of settlement and treatment as part of the proposed construction phase, the rehabilitation of temporary construction areas and the use of settlement ponds and wetlands as part of the operational phase.

The proposed wind farm is located in the Little Brosna (040) which is currently at poor status (2019-2024). The Riverstown monitoring station (RS25L020700) was at Q3-4 (Moderate) status in 2021 and Q3 (Poor) in 2023.

The main pressure on the catchment as with many rural catchments is agriculture followed by hydromorphology and peat extraction. The Proposed Project will reduce agricultural and forestry pressures, increase the areas of surface water settlement/ ponds (settlement ponds, flood compensation) and reduce the area of peat extraction (turbary) and rehabilitate 5 hectares of degraded peatland.

These measure not only provide for the treatment with the wind farm but provide additional measures which will improve overall water quality. The proposed windfarm and relevant measures will contribute is a beneficial way to improve the water quality of the streams however the existing main pressures on the Little Brosna Subbasin which are agriculture and extractive industries.

The Proposed Project will provide 2 ha of wetlands, cessation of turbary in 6 existing plots, reduction in agriculture within the footprint and the rehabilitation of over 5 hectares of degraded raised bog. The Proposed Project will result in a reduction of 5 hectares of peat drainage and remove 3.01 hectares of turbary from future extraction.

In actively managed, drained peatlands, P losses occur through tile/mole drainage and surface runoff. A total of 14.1 ha of GA1 Improved agricultural grassland, 3.27 ha of WD4 Conifer plantation, 0.96 ha of BC1 Arable crops will be removed from agricultural production. 5 hectares of agricultural land are located in areas with peat or peaty podzols.

The removal of these lands can result in the mobilisation of sediment and nutrients in the short term. While the long term reduction of agricultural inputs and creation of wetland/settlement ponds will reduce P load, the overall P load reduction is not significant either in the short term or long term. No P has been applied to the agricultural lands in 2 years reducing the potential losses.

³⁵ Schauer, L.S., Jawitz, J.W., Cohen, M.J. and Musolff, A. (2025), Spatial and Temporal Variability of River Water Quality. *Hydrological Processes*, 39: e70154. <https://doi.org/10.1002/hyp.70154>

It is suggested that the assessment does not assess the relevant tributaries. This is incorrect. The relevant tributaries are assessment in the baseline. A number of minor tributaries are mentioned including the Kyleneamuck stream. This was sampled as part of the baseline assessment. The Kyleneamuck stream is ephemeral i.e. dry during the summer months.

The Kyleneamuck stream is a straightened channel and is in poor condition. The stream is in poor condition due to historical land drainage. The Proposed Project will not alter the stream and there is no works within T1 is located in the Kyleneamuck catchment however measure to address construction stage runoff is included. During the operational phase, there are no significant effects and approximately 230 m to the north of the hardstanding.

3.28.4 *Dewatering and monitoring*

A number of submissions were made in relation to turbidity and dewatering.

Turbidity will be managed in accordance with the Surface Water Management Plan (SWMP) (see EIAR Appendix 9-4). Turbidity monitoring is proposed for the surface water with details provided in the SWMP and includes continuous/real time monitoring.

The potential generation of suspended solids (and therefore elevated turbidity) is a result of construction works and any discharge from the excavations will pass through the surface water management network. Measures are also outlined in the SWMP to prevent the generation of elevated suspended solids at source.

3.28.5 *Site specific refuelling details*

Refuelling will be undertaken in dedicated areas as outlined in EIAR Chapter 9 (Hydrology and Hydrogeology). It is proposed to install an oil/water separator at the construction compounds and substation prior to discharging to the proposed settlement ponds. The storm water entering this system will include run-off from the refuelling areas and therefore may contain hydrocarbons which require removal. The separator has been sized to cater for <1000 m² of hardstand

Refuelling with bowser will be undertaken in accordance with the mitigation outlined in EIAR Chapter 9 (Hydrology and Hydrogeology), the Construction Environmental Management Plan and in accordance with HSA guidance on ADR (2025) *Agreement Concerning the International Carriage of Dangerous Goods by Road*³⁶.

3.28.6 *Forestry clearance and risk of suspended solids*

Submission:

A number of submissions were made in relation to the generation of sediment from forestry felling.

Response:

Forest felling will be undertaken as part of the construction works. The standards for felling and reforestation describe the universal standards that apply to all felling (thinning, clear felling) and

³⁶https://www.hsa.ie/eng/your_industry/adr_-carriage_of_dangerous_goods_by_road/information_guidance

reforestation projects on all sites. The standards will be implemented under a felling licence issued by the Department of Agriculture, Food & the Marine.

In accordance with the Forestry and Water Quality Guidelines (Forestry Service, 2000), buffer zones will be identified and marked out on the ground. These guidelines deal with sensitive areas, erosion, buffer zone guidelines for aquatic zones, ground preparation and drainage, chemicals, fuel and machine oils. Construction activities will be curtailed within the buffer zones in order to reduce erosion and sedimentation and, therefore, to protect surface water quality.

A Forestry Report is included with the application as detailed in EIAR Appendix 2-8.

3.28.7 *Surface water protection*

Submission:

Concern was raised in relation to sediment during flood events.

Response:

The existing forestry and farm drains are trapezoidal and offer little sediment retention during high flow events. Swales along the access track to T9 will be chambers as shown on the drainage drawing and will be hydroseeded to prevent erosion by providing foliage on the swale.

Slopes on site are shallow to moderate. Hessian cloth is typically used on steep slopes- i.e. >1:3. These steep slopes do not occur on site. Slopes are shallow and areas where slopes are greater than 1:12 only occur on access tracks to turbines T4 and T6.

Concern was raised on the potential alteration in water runoff characteristics generally associated with large developments that do not have appropriately designed drainage systems. Runoff from the development area will be maintained at greenfield runoff rates with significant treatment in terms of flow and quality using various SuDS measures. The SuDS surface water management will mimic natural drainage by:

- Storing runoff and releasing it slowly (attenuation);
- Slowly transporting (conveying) water on the surface;
- Filtering out sediments/pollutants; and
- Allowing sediments to settle out by controlling the flow of water.

The settlement pond is designed following the guidance in the CIRIA SuDS Manual (C697) to attenuate runoff to existing greenfield runoff rates. The attenuated runoff volume for the 1 in 100-year 6-hour event (plus 20% climate change allowance) is limited to the greenfield runoff volume. Each of the constructed settlement ponds and flood compensation area will provide an excess of volume to cater for this runoff (with additional storage capacity for 1:100 yr extreme events plus climate change). The proposed drainage design is considered appropriate for the proposed site. Due to the design of the hardstand areas, the runoff co-efficient based on empirical evidence is 85-90% due to the gravel surface (increased storage) and shallower slopes (<1 degree).

3.28.8 *Private well queries*

A number of queries were raised in relation to private wells and the potential for contamination.

The aquifer potential of a bedrock unit is determined by the groundwater productivity, which in turn is determined based on hydraulic characteristics compiled from borehole data throughout

the country. The GSI categorises the aquifer bodies into Regionally Important Aquifers, Locally Important Aquifers and Poor Aquifers. These are then subcategorised to create a total of seven bedrock aquifer categories and two sand and gravel aquifer categories.

The proposed wind farm is predominantly underlain by a Locally Important Aquifer (LI) - Bedrock which is Moderately Productive only in Local Zones. The subsoil deposits overlying the bedrock are not considered to be of sufficient lateral extent or depth to represent a significant aquifer body.

Where more permeable soils are present, groundwater flow is shallow, localised, and typically discharges at lower elevations via drainage channels to surface water bodies.

The main source of contamination for groundwater wells is local contamination from septic tanks and agriculture. These sources introduce harmful bacteria, viruses, and nitrates into groundwater, which can then enter poorly protected wells. The minimum recommended distance between a wastewater treatment system and well varies from 15 m to 60 m depending on the slope and soil type and is set out in the Code of Practice for new builds - Site suitability assessment³⁷. The Proposed Project does not have a proposed septic tank and will not significantly alter agricultural practices. Wastewater from the site will be tankered off site as detailed in Chapter 9 Hydrology and Hydrogeology.

3.28.9 *Seasonal Flood Risk along the GCR*

Submission:

A submission was made in relation to flooding along the grid route

Response:

The Flood Risk Assessment (FRA) (see EIAR Appendix 9-3) acknowledges that while the wind farm site itself is not at risk of flooding, certain access routes and local roads associated with the project may be affected during flood events. The assessment identifies both fluvial and pluvial flood extents along sections of the access tracks and GCR, noting that although turbine and substation locations have adequate freeboard and lie outside mapped flood zones, some portions of the access infrastructure intersect areas classified as flood-prone within the PFRA datasets. The FRA confirms that where tracks cross watercourses, a Section 50 consent will be required to ensure these crossings are designed so that they do not alter existing hydraulic conditions or contribute to increased flood risk.

The FRA demonstrates that flood risk affecting access routes has been appropriately assessed and that the identified mitigation and operational measures effectively address the potential for temporary inundation, even though the development site itself remains outside areas susceptible to flooding.

3.28.10 *Construction dewatering*

Peat on the site has been drained by agricultural drainage schemes over the 40 years as well as by ongoing turbary cutting. Dewatering is not required for the borrow pits as shallow excavation is proposed. In terms of construction, where peat is deeper than 1 m excavations will be undertaken by sheet piling as stated in the EIAR.

³⁷ <https://www.epa.ie/environment-and-you/drinking-water/faqs/>

No peat was encountered at the proposed borrow pits. Borrow pits are shallow and do not require extensive dewatering. All surface water run-off from the proposed wind farm site will pass through settlement ponds. It is proposed to locate settlement ponds downstream of borrow pits and associated stockpile areas, each hardstand and along all the proposed wind farm site access tracks. Drainage drawings are presented in Drawing 11333-2061 to 11333-2065. Interceptor cut-off drains around the borrow pits will be provided to divert overland flows and prevent these flows from entering the borrow pits. These flows will discharge diffusely overland, creating a buffer before entering the surface water management infrastructure.

Water that accumulates in the borrow pits will be directed to a sump. Water from the sump will pass through a silt bag prior to a settlement pond or a mobile Siltbuster system as detailed in Appendix 9-4 SWMP.

3.28.11 *Distance to River /Peatland SAC*

Submission:

A number of submissions were made in relation to the distance of T8 and T9 to the Little Brosna. The distance from T8 and T9 from the Little Brosna is 84m and 108 m from the Little Brosna.

Response:

The distance to the active bog (subcentral ecotope) area in Sharavogue is 350 m, as mapped by the NPWS. The distance to the lagg/fen areas within the Sharavogue Bog SAC is 850 m to 910 m. The distance from Peat Deposition Area 1 is 170 m to the North Cloonaheen stream.

As detailed in the EIAR Chapter 9 (Hydrology and Hydrogeology), the proposed wind farm (in particular T8 and T9) is underlain by a deep low permeability soils and short flow paths. Permeability values in the alluvial silt/clay soils are low ($< 1 \times 10^{-8}$ m/s).

The proposed boundary is 10 m from the SAC however the red line does not represent the area of development. The distances from turbines to the SAC and QI habitats is set out in the above paragraph.

3.28.11.1 *Landslides /Peat stability*

Submission:

Concern was raised in relation to potential impacts on water quality caused by landslides. Meenbog and other peat landslide areas are mentioned in the submissions.

Response:

In response, landslides and peat slippages can cause significant impacts on downstream water quality, and in the event that they reach streams and rivers this can be particularly impactful to aquatic ecology (as per the slippage at the Meenbog wind farm).

As described in EIAR Chapter 8 (Land, Soils and Geology) of the EIAR, the site is underlain by peat deposits however conditions in this flat, low-lying environment do not pose significant landslide risks. Considering the above and information provided in the EIAR, it is not anticipated that landslides would pose any significant threat to water quality. EIAR Chapter 8 (Land, Soils and Geology) of the EIAR confirmed there would be no significant effects.

The site is located in an area classified as low landslide susceptibility. This is further confirmed by the PSRA – See appendix 8.2.

Areas were identified in terms of peat deposition with excess capacity provided within the site.

3.28.11.2 *Loss of Agricultural Lands*

Concern was raised regarding the loss of agricultural lands in the area.

The footprint of the proposed wind farm infrastructure will require approximately 30 hectares (ha). All landowners, (including landowners of agricultural lands), involved in the proposed wind farm site development have consented to the planning applications (see consent letters submitted with the planning application).

The planning application boundary for the wind farm only includes for the development, not the entire site folios. Any agricultural lands surrounding the infrastructure can continue to be used for agriculture if the landowner so wishes. When the wind farm is decommissioned, those lands will also be available again for agricultural use. This project also enables those landowners the opportunity to diversify their income from their land for the lifetime of the project.

3.28.11.3 *Peatland Areas*

No extraction is taking place in raised bog therefore the premise of dewatering is not applicable and does not relate to the proposed application. As outlined in the EIAR Appendix 6-1, over 5 hectares of peatland are proposed for restoration.

It was raised that the degraded peatland at T4 could be reinstated in the longer term. The area at T4 is a turbary strip which future turbary was purchased as part of the Proposed Project. In the absence of the Proposed Project, these 6 turbary strips will revert to the previous use.

In relation to the dewatering effects, sheet piles will be utilised at T4, T8 and T9.

3.28.11.4 *AFA Programme of Measures*

As stated above, excess nutrient loss, mainly phosphate, leading to eutrophication is an issue for rivers in the catchment. The significant pressures relating to excess nutrients are primarily agricultural (diffuse), but also urban wastewater, peat, industrial discharges, aquaculture and forestry. The Proposed Project will not increase the phosphate loading and will result in a modest decrease in the phosphate loading from the areas proposed for the construction areas.

The Proposed Project will provide 2 ha of wetlands, cessation of turbary in 6 existing plots (3 hectares of degraded bog), reduction in agriculture within the proposed wind farm footprint and the rehabilitation of over 5 hectares of degraded raised bog (See Appendix 6-1 BEMP). These measure not only provide for the treatment with the wind farm but provide additional measures which will improve overall water quality. The proposed windfarm and relevant measures will contribute to improving the water quality of the streams which is in line with the AFA measures. However the existing main pressures on the Little Brosna Subbasin which is agriculture will remain.

Phosphorus and Iron:

As stated above, the Proposed Project will not increase the phosphate loading and will result in a modest decrease in the phosphate loading from the areas proposed for the construction areas. This reduction applies both to the construction and operational phase.

While orthophosphate/MRP is a pressure on surface waters, there is no evidence of elevated concentrations at Riverstown bridge. Summary (mean) data from Riverstown bridge is included

below in Table 3-4 from 2007-2024. All concentrations since 2007 are substantially below the standard required for Good Status.

Table 3-4 Mean Annual ortho-phosphate concentrations

2007	Mean	0.039
2008	Mean	0.022
2009	Mean	0.020
2010	Mean	0.026
2011	Mean	0.031
2012	Mean	0.025
2013	Mean	0.013
2014	Mean	0.012
2015	Mean	0.015
2016	Mean	0.021
2017	Mean	0.021
2018	Mean	0.013
2019	Mean	0.011
2020	Mean	0.019
2021	Mean	0.023
2022	Mean	0.022
2023	Mean	0.018
2024	Mean	0.018

Peat soils in Ireland have low phosphorus adsorption capacity due to high organic matter (>20%), meaning they cannot bind or store phosphorus like mineral soils. Any excess fertilizer or organic manure applied beyond immediate crop uptake is highly vulnerable to leaching and runoff into local water bodies, particularly during heavy rainfall and storm events. Phosphorous application is carefully managed by the involved landowners. Even allowing for a 100 % runoff from the agricultural peat areas, The scale of the proposed wind farm will not result in significant negative effects in the short term or significant long term beneficial effects as the proposed wind farm area only comprises <3% of the wind farm site and <0.1% on a river basin scale.

Iron – It is suggested that one trial pit revealed evidence of iron. Extensive drainage channels throughout the site do not reveal iron or iron ochre. Orange/yellow water was encountered in TP17 however no deep excavations are proposed for the Substation. Furthermore, there are no iron standards set out under the Surface water regulations (S.I. No. 272 of 2009 as amended).

3.29 BIODIVERSITY

3.29.1 *Marsh Fritillary*

Summary:

A number of submissions raised concerns regarding the adequacy of the Marsh Fritillary baseline, particularly the absence of adult surveys and reliance on a single larval web survey in September 2023. Objectors also highlight the predicted unmitigated loss of the local breeding population and question whether the proposed mitigation is sufficiently robust to address this effect. Particular concerns relate to the suitability of the receiving habitat, reliance on translocation, availability of Devil's-bit Scabious, apparent inconsistencies between references to total population loss and a retained population, and conflicting figures for the area of habitat proposed for management.

Response:

The concerns regarding Marsh Fritillary substantially overlap with those raised by the DoHLGH and Planning Authority and addressed in the preceding responses, including survey adequacy, effects on occupied habitat, translocation, habitat enhancement and long-term monitoring.

While no targeted adult surveys were undertaken, the September 2023 larval web survey confirmed successful breeding within the Proposed Project site. The assessment therefore proceeded on the basis of confirmed presence rather than relying on an absence of records to discount potential effects. The potential for larval web distribution to vary between years is also recognised, with pre-construction surveys included within the proposed mitigation.

The reference to the potential "total loss of the local breeding population" relates to the predicted effect in the absence of mitigation measures, whereas references to a retained population relate to the intended outcome following mitigation. These therefore represent different assessment scenarios rather than contradictory conclusions.

Translocation is also not relied upon as the sole mitigation measure. The proposed strategy includes avoidance and protection where practicable, management and enhancement of suitable habitat, translocation of Devil's-bit Scabious, pre-construction surveys and longer-term monitoring. The receiving habitat is therefore proposed to be actively managed and enhanced to provide suitable conditions for the species.

The inconsistency between the habitat management areas presented within the EIAR and BEMP is acknowledged. For clarity, 2.8 ha represents the area proposed for management and enhancement for Marsh Fritillary. This area is over 10 times the potential area affected. A

number of successful translocations effects have effectively reintroduced Marsh Fritillary in the UK³⁸ and Germany³⁹. A number of common themes have emerged such as

Habitat restoration before release.

High abundance of devil's-bit scabious.

Appropriate grazing management.

3.29.2 *Sharavogue Bog SAC and Other European Sites*

Summary:

A number of submissions raised concerns regarding the close proximity of the Proposed Project to Sharavogue Bog SAC, including the approximately 10 m separation between the project and SAC boundary. Submissions contend that hydrological connectivity exists between the Proposed Project site, the Little Brosna River and the SAC and that construction, peat disturbance and associated runoff could affect the hydrological functioning and integrity of the SAC. Particular concern is also raised regarding the ongoing restoration of Sharavogue Bog SAC and whether the Proposed Project could interfere with its restoration objectives.

Response:

The concerns regarding Sharavogue Bog SAC strongly overlap with those raised by the DoHLGH and Planning Authorities and have been addressed above, particularly in relation to groundwater and surface water connectivity, raised bog habitat, air quality and the ongoing restoration of the SAC.

The close proximity of the Proposed Project boundary to Sharavogue Bog SAC is acknowledged and was identified within the submitted NIS. However, proximity to the SAC does not in itself demonstrate that the proposed works will adversely affect the integrity of the site as defined by the conservation objectives and status. The assessment considered the potential pathways through which effects could arise, including surface water and groundwater pathways, and the potential for effects on the hydrological conditions supporting the qualifying habitats.

The ongoing restoration of Sharavogue Bog SAC is also acknowledged. As discussed in the preceding responses, the assessment did not identify a pathway through which the Proposed Project would alter the hydrological regime supporting the qualifying interest habitats of the SAC and its conservation objectives.

3.29.3 *Peatland Habitats, Hydrology and Drainage*

A number of the submissions are addressed in Section 3.27 and in Section 2.3 of this report. A number of submissions were made in relation to the area around T4 and the cutover bog was recovering. This is incorrect. The area around T4 and for 200 m to the northwest and southeast are active turbary plots. The turbary plots to the northeast of T4 are within the control of the developer and will not be removed, as would occur in a do-nothing scenario.

³⁸ <https://www.wild.cymru/marsh-fritillary-project-update-2/#content>

³⁹ <https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE09-NAT-DE-000010/reestablishment-of-the-marsh-fritillary-euphydryas-aurinia->

3.29.4 *Aquatic Ecology and Fisheries*

Summary:

Concern is compounded by the survey limitations - which acknowledges that some small areas could not be fully surveyed on foot due to dense vegetation, drainage ditches and soft cutover bog habitat, and that deep sections of watercourses were un-wadable and too deep to fully access for aquatic surveys. While visual assessment from adjacent lands, banks, roads and aerial photography may assist in addressing such constraints, these limitations further reinforce the need for clear seasonal justification and a precautionary interpretation of survey results.

Response:

The survey limitations regarding the aquatic surveys were in relation to deep wet drainage ditches and deep-water levels in the Little Brosna channel which were 3m deep in sections at low water levels. While the surveys were carried out within the optimal season (July – September for electrofishing and white-clawed crayfish survey and May - September for Riverine Habitat Assessments and aquatic plants), the main channel was not accessible in some areas. Every effort was made to access the watercourses safely where suitable wadable waters were present and TOBIN insured that each watercourse within the study had a survey carried out to represent the aquatic ecology of the watercourses.

A robust desktop study was also carried out on the watercourses within the study area. This included researching any information on the presence or fish or their spawning habitats that have previously been recorded during the past 20 years within the 10 km grid squares (hectad) S09 and N00 which encompass the Proposed Project. This included relevant mapping and databases of fish species via National Parks and Wildlife Services, National Biodiversity Data Centre, Environmental Protection Agency, Water Framework Directive as well as published and unpublished NPWS reports on protected habitats and species including Ireland Red List No. 5 Amphibians, Reptiles & Freshwater Fish (King *et al.*, 2011)⁴⁰ Irish Wildlife Manuals No. 116, Checklist of Protected and Threatened (Nelson *et al.*, 2022)⁴¹, a review of published research data and documents from Inland Fisheries Ireland (IFI) and a review of all other relevant ecological reports within the study area. This allowed TOBIN to gather all relevant existing data on the watercourses and the potential fish within them. This helped establish the most up to date relevant data of the study area. Consequently, while not all of the relevant watercourses could be fully surveyed due to health and safety concerns, the supplementation of a detailed desktop study ensured a robust assessment was undertaken to inform both the EIAR and NIS.

Summary:

Concerns for the lack of fish surveys carried out at culvert crossings and a lack of proper fish passage assessments at the fourteen proposed drainage crossings.

⁴⁰ King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

⁴¹ Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

A request for an aquatic ecology baseline that names and assesses the Croneen brown trout sub-population, salmon, lamprey and eel during their migration and a corrected WFD assessment.

Response:

The baseline aquatic surveys for the Proposed Project included a baseline fish habitat assessment at accessible watercourses, both within the Proposed Project site and downstream. This allowed for the identification of fish species present, their numbers and age class as well as identifying suitable spawning and nursery habitats, water quality, any potential barrier to their migration.

The internal drainage channels identified are limited in size and were predominantly dry during the time of the surveys. The drainage channels where water was encountered are included in Appendix 6-3 Aquatic Report of the EIAR.

The migration of these species occurs between early October to late March. While a visual assessment and redd count may be carried out to establish if fish are spawning within the habitats, this assessment would not increase the protection given to their spawning habitats that are identified during summer months when adult fish are not present.

As part of the desktop study, a search is carried out for any data collected by IFI within the study area, including electrofishing surveys, drone studies, drone technology, acoustic telemetry studies and eDNA sampling to help establish the occurrence and distribution of protected species within the watercourses, the extent of lamprey spawning behaviour, and any barriers present to prevent their migration. This data is used to establish the presence of fish within the study area and insuring both their protection and the protection of their feeding and spawning habitat.

Electrofishing surveys

Summary:

A number of submissions were made in relation to the electrofishing programme been poorly timed, and that it was specifically timed to miss the critical migration and spawning periods for all lamprey species in the river and that Silver Eel, Atlantic Salmon and River Lamprey were not adequately surveyed during migration seasons.

Response:

Electrofishing surveys were carried out under licence in August 2021. Electrofishing surveys require a formal Section 14 Authorisation or survey permit from IFI and are strictly restricted to be carried out during the period between the 1st of July and the 30th of September. This timing protects fish during vulnerable life stages such as peak spawning to prevent physical disruption and stress to vulnerable fish and coincides with lower, more stable river flows. Electrofishing is strictly not permitted to be carried out during the spawning season for the protection of fish species such as Salmon and Brown Trout. The electrofishing survey programme undertaken to inform the Proposed Project was therefore restricted to within the optimal survey period as well as within the timing limits specified by IFI.

3.29.4.1.1 Fish

Summary:

There is witness to successful Brook Lamprey spawning (an Annex II species) near Sharavogue Bridge and a list of freshwater fish species, including Croneen Trout, Brown Trout as well as Lamprey, Eels and Otter have been stated to have been sighted from Sharavogue Bridge within the Little Brosna.

Response:

While no lamprey sp. were recorded during the electrofishing surveys at Site 1 near the Sharavogue Bridge in August 2021, suitable spawning habitat to support the species was recorded. The sparse coarse sand and silt deposits behind boulders and along the margins provided moderate habitat potential for lamprey ammocoetes.

Field surveys and desktop studies confirmed the presence of these species within the study area of the Proposed Project and both River and Brook lamprey were considered key ecological receptors, and appropriate mitigation measures were stipulated to ensure their protection.

Croneen Trout

Summary:

There is a lack of knowledge or mention of the Croneen Trout, a genetically distinct and irreplaceable subpopulation of wild brown trout recognised by IFI as a national priority and protected by Annex V.

Response:

There are several varieties of Brown Trout that occur in Irish freshwaters, including Ferox, Gillaroo, Sonaghan and Croneen. The Croneen is a distinct strain of freshwater migratory wild Brown Trout native to the River Shannon catchment. The Croneen Trout migrates from Lough Derg to the pristine headwaters of the upper Camcor River and the Little Brosna to its spawning and nursery areas and subsequently migrates back to Lough Derg where it spends most of their adult lives feeding in the deep waters.

For this reason, it is crucial that water quality be maintained for this species and all other freshwater species, including Annex II species Lamprey sp. that were recorded during surveys within the Little Brosna River and downstream. All mitigation measures associated with sediment and pollution control outlined in Chapter 9 – Hydrology and Hydrogeology of the EIAR will be implemented, which will ensure the protection of not only the Brown Trout species but all freshwater fish species within the rivers that are hydrologically connected to the Proposed Project to which they spawn and feed in.

Fish Spawning

Summary:

That the construction-phase of the project will cause sedimentation which will further degrade already sensitive gravel spawning patches.

Response:

Section 6.7.1.6.1 of Chapter 6 – Biodiversity within the EIAR lists specific mitigation measures to prevent siltation to nearby waterbodies, including the construction of settlement ponds as well as a Surface Water Management Plan (Chapter 9 - Hydrology and Hydrogeology) which will be implemented and mitigation measures which will be used to control water quality impacts which are detailed in Chapter 8 – Land, Soils and Geology.

Vibrations on Fish

Summary:

The impact of disturbance from vibration from years of construction and 35 years of operation on sensitive migratory fish salmon and trout, a stressor that was ignored.

Response:

During the operation of the proposed wind farm, as outlined in Chapter 11 - Noise & Vibration, the predicted noise levels associated with the Proposed Project will be within best practice noise criteria curves in line with guidance in the Wind Energy Development Guidelines. The assessment concluded that the Proposed Project, during both the construction and operation phases will not result in any significant noise or vibrations.

It is considered that any disturbance during the construction and operational phase would result in imperceptible negative effects on protected fauna at a local geographical scale.

3.29.4.1.1.2 White-clawed Crayfish

Summary:

Concerns the Crayfish survey was insufficient as they are nocturnal and recorded 4km downstream.

Response:

It is stated in Section 6.4.1.2 of Chapter 6 – Biodiversity that White-clawed Crayfish have previously been recorded within the 10 km grid squares which encompass the Proposed Project, with two records of their presence within the Little Brosna_040 RWB in 2021, approximately 4 km downstream of the study area. White-clawed Crayfish have not been previously recorded in any of the watercourses which traverse through the proposed wind farm site.

A survey for the presence of White-clawed Crayfish and suitable habitat were assessed at each aquatic survey site within the study area. These surveys followed methodologies outlined in '*Guidance on Habitat for White-clawed Crayfish*' (Peay, 2002)⁴². This included a visual and hand search for the species in line with the guidance.

White-clawed Crayfish are primarily nocturnal, when they emerge from their refuge under large rocks, boulders, tree roots, or inside crevices along river to feed. A hand and visual search was carried out under any refuges to locate their presence.

Electrofishing also has the ability to stun crayfish during the fish stock assessment, this is also another opportunity to detect and confirm their presence. They may also be captured during kick sampling surveys. Crayfish were not recorded during the hand searching, electrofishing or kick sampling surveys. Additionally, no evidence of carapace or claw remains were recorded on the riverbanks or bridge ledges in the form of Otter scat or remains from predation.

The streams located within the Proposed Project site did not have any suitable habitat to support White-clawed Crayfish due to the presence of peatland and afforested catchments and the absence of suitable substrate habitat, especially gravels for White-clawed Crayfish hatchlings. There was also a lack of instream vegetation and suitable burrowing habitat required

⁴² Peay, S. (2002) Guidance on Habitats for white-clawed Crayfish and its Restoration. Environment Agency Technical Report W1-067/TR

for the species. Similarly, the underlying geology underneath the watercourses draining the Proposed Project was considered suboptimal for the species. Consequently, White-clawed Crayfish were not considered a key ecological receptor within the zone of influence of the Proposed Project.

3.29.5 *Bats*

Summary:

A primary concern of Third Party Submissions in terms of bats is the potential for the displacement and mortality of bats during the construction and operational phase of the project. Submissions state that the survey effort is not adequate to accurately assess the impacts on local bat populations, referencing the GBWAG submission. There are further concerns around the level of roost surveys, surveys at a height, and the potential for bats to be attracted to turbines. There is a concern raised suggesting that there will be increased bat roosting in unrelated residential buildings as a result of displacement of bats during the construction and operational phases of the proposed wind farm.

Within the GBWAG submission concerns are raised surrounding the survey effort completed, in terms of bat activity and movement corridors resulting in insufficient baseline data. The submission states that the effects of turbine operation on bats is not assessed with sufficient certainty.

The GBWAG submits that there is not sufficient clarity, definition of parameters, or procedures in place with regards to bat activity levels that will trigger a requirement for curtailment. The submission suggests that a precautionary bat curtailment strategy should be defined at a consent stage. The submission raises concerns that there is a requirement for operational curtailment based on the recorded baseline and that further monitoring with an allowance for curtailment is a reversal of the precautionary principle.

The submission asserts that operational risks constitute deliberate killing of a protected species and that a derogation under Regulation 54 is required. The submission reasserts this in relation to the presence of roosting bats in bridge B08 and the PRF-I trees on the site. The submission also states that curtailment is a standard mitigation measure described in Marnell et al. (2022)¹³.

The submission acknowledges that the ECOBAT online tool was not used as part of the activity assessment and that reliance on activity scales generated based on professional judgement lack transparency. The GBWAG submission raises concerns surrounding the cumulative assessment and that no cumulative collision mortality figure is produced. The submission also highlights a concern with regards to a lack of detail in fatality monitoring methodology.

Response:

Bat surveys at the proposed Ballincor Wind Farm site were carried out by qualified Ecologists with significant experience of the assessment of bats in relation to onshore wind projects in Ireland. Robust and compliant surveys were carried out which meet or exceed the standards required by NIEA (2026)¹⁰, Marnell et al. (2022), and NatureScot (2021) (see Section 2 of Bat Survey Report (O'Donnell Environmental, 2026 contained in Appendix 6-2 of the EIAR)). The baseline data generated was used to assess potential operational impacts on bats following the risk assessment methodology contained within NatureScot (2021)⁹.

The need for curtailment during post-construction monitoring is outlined in Section 6.3 of the NIEA (2026)¹⁰ guidance. NIEA classifies the discovery of more than one bat carcass per turbine per year as significant - such that mitigation would be appropriate. In this case operational curtailment is the only remaining mitigation within guidance, other than deterrent systems which NIEA advises against.

The submission outlined curtailment described as a mitigation measure within Marnell et al. (2022). However, this guidance places a higher importance on siting turbines away from roosting and foraging features while acknowledging that more data is needed to implement effective curtailment in an Irish landscape. In line with Marnell et al. (2022), the approach taken in the design of the proposed Ballincor Wind Farm focused on avoidance of ecological effects on bats. For example, bat buffers are specified within which significant habitat features (e.g. treelines and woodland) will be removed, and this will reliably limit the potential for bats to forage near turbines.

A site-specific comparison of recording locations in the open (T1, T2, T4) versus those proximal to foraging features (T5, T8, T9) is provided in Table 3.8 of the Bat Survey Report (O'Donnell Environmental, 2026) contained in Appendix 6-2 of the EIAR, and this analysis demonstrates a significant reduction in bat activity overall in open areas versus proximal to significant habitat features. The site-specific data demonstrates that turbine buffers as described in NatureScot (2021)⁹ would be effective mitigation for species such as Common Pipistrelle and Soprano Pipistrelle. Leisler's Bat activity levels were relatively 'low' to 'moderate' in the majority of recording locations, and in the absence of high levels of Leisler's Bat activity and given the implementation of 'feathering' of idling blades, further operational curtailment is not considered necessary. The acknowledgement of the possible need for future curtailment based on monitoring is appropriate given that best scientific information (e.g. NatureScot, 2021) acknowledges that pre-construction bat activity is not necessarily a reliable predictor of operational phase collision risk. In line with best practice guidance, post-construction monitoring is proposed. NIEA (2026)¹⁰ states:

"...pre-construction bat activity surveys may not always be a good predictor of the actual risk of a proposed wind turbine project to bats. Further, bat behaviour at wind turbine sites may change post construction. Therefore, a programme of post construction monitoring of bat activity and searches for bat carcasses at an operational wind turbine site is often necessary to check that pre-construction predictions of risk are accurate and that any mitigation implemented has been effective".

NatureScot (2021)⁹ guidance advises that bat casualties on wind farms are likely to be classed as incidental fatalities within the Habitats Directive. This guidance does highlight that levels of fatalities may exceed incidental levels and constitute intentional or reckless killings. In *Doyle and Ors v An Coimisiún Pleanála [No. 3] [2026] IEHC 156*, the High Court held that "*it is settled law that a derogation licence should be obtained before a development consent if derogation is probable as opposed to being a mere possibility*". The determination of the Bat Survey Report (O'Donnell Environmental, 2026) contained in Appendix 6-2 of the EIAR, based on the bat activity data and the application of mitigation, is that there will be a significantly reduced likelihood of bat fatalities as a result of the operation of the proposed wind farm and while bat fatalities are possible, they are not probable.

On the basis of the best available information, further mitigation above and beyond that already prescribed, or a Derogation under Regulation 54, are not required. Should post-construction monitoring meet the thresholds outlined in NIEA (2026)¹⁰, there would be a future need for the application of curtailment and possibly derogation under Regulation 54.

In the absence of a published objective or standardised approach to classifying bat activity levels in an Irish context the activity scale used to describe bat activity within this report was based on the expertise and experience of the authors. While NIEA (2026)¹⁰ encourages the use of ECOBAT in order to improve the usefulness of the system in future, it states ECOBAT is “currently unlikely to produce results which accurately reflect the species composition and bat activity levels normally encountered on wind turbine sites in Northern Ireland”.

Cumulative assessment with regards to bats centres around the site-based risk assessment matrix as per NatureScot (2021)⁹. This assessment was carried out within Section 4.4 of the Bat Survey Report (O'Donnell Environmental, 2026) contained in Appendix 6-2 of the EIAR. The size and proximity of other wind farm sites were considered in terms of the project size (Section 7 of NatureScot (2021)⁹). The results of the cumulative assessment through the use of the matrix did not change the categorisation of site risk and is accurately reflected within the assessment of effects and implementation of mitigation. There are no mechanisms to quantitatively assess bat collision risk. In the absence of such models, the best available methodology is the site-based risk assessment detailed in NatureScot (2021)⁹.

The Bat Survey Report (contained in Appendix 6-2 of the EIAR) details that fatality monitoring will be carried out in line with Appendix 4 of NatureScot (2021)⁹; “*Recommended methodology for more intensive studies of mortality rate at turbines*”. This includes searcher efficiency trials and scavenger removal rate surveys. It also includes the provision of dogs or human searchers based on habitat suitability and the results of observer efficiency trials.

3.29.6 Otter

Summary:

Concerns were raised regarding the adequacy of the Otter baseline survey and the potential for disturbance and water quality effects during construction. In particular, the identification of a potential holt within the development site, limitations in survey access and the lack of detailed survey effort information. Concerns were also raised regarding whether the requirement for a derogation licence has been adequately considered prior to consent, rather than relying on pre-construction surveys. Submissions additionally refer to regular Otter activity along the Little Brosna River and potential effects from construction noise, vibration, lighting and deterioration in water quality.

Response:

The concerns regarding Otter are acknowledged. Otter surveys were undertaken between 2022 and 2025 and were supported by desk-study information and habitat assessment. While access constraints occurred within parts of the drainage network, a potential Otter holt was identified and the assessment proceeded on the basis that this feature could be reoccupied.

Potential construction disturbance to Otter was assessed within Chapter 6 - Biodiversity, with pre-construction surveys and appropriate protection measures included as mitigation. These pre-construction surveys are intended to confirm the current status of potential resting or

breeding sites immediately prior to works, recognising that their use can change over time. Where an active holt is identified and the proposed works could result in an offence, the relevant statutory requirements, including any requirement for a derogation licence, will apply.

Potential effects on Otter associated with deterioration in water quality were also considered within the NIS in relation to the River Shannon Callows SAC. These effects are addressed through the surface water management and pollution prevention measures incorporated into the Proposed Project.

3.29.7 *Other Mammals*

Summary:

A number of submissions raised concerns regarding the presence and potential displacement of mammals within the Proposed Project site and surrounding area, including Irish hare, red squirrel, pine marten, deer, fox, hedgehog and badger. Concerns were raised that some species, particularly Irish hare and red squirrel, were not subject to dedicated surveys or individual assessment despite being regularly observed locally. Several submissions also raised concerns that construction disturbance could displace badgers from existing territories and increase their movement onto surrounding farmland, with potential implications for bovine tuberculosis (TB).

Response:

The local observations of mammal species within and surrounding the Proposed Project site are acknowledged. Chapter 6 - Biodiversity within the EIAR considered the mammal assemblage recorded or considered likely to occur based on field surveys, desk-study information and the habitats present. The absence of a dedicated species-specific survey does not necessarily mean that a species was excluded from the assessment; rather, survey and assessment effort was proportionate to the ecology of the species, habitat present and potential pathways for effects.

Potential effects on mammals associated with habitat loss, disturbance and displacement during construction were considered within the Chapter 6 - Biodiversity, with appropriate mitigation incorporated for protected species where required. The presence of species such as Irish Hare, Red Squirrel, Pine Marten and deer within the wider landscape is therefore not inconsistent with the ecological baseline or conclusions of the assessment.

Concerns regarding badger disturbance is also acknowledged. Potential effects on Badger and known setts were considered within the assessment, with measures provided to protect setts and minimise disturbance during construction. While submissions raise concerns regarding potential displacement and associated TB risk to surrounding farms, the proposed mitigation is intended to avoid significant disturbance or displacement of Badgers from established setts. The wider management of bovine TB falls outside the scope of the ecological impact assessment.

The main government body responsible for bovine tuberculosis (TB) and its relationship with badgers is the Department of Agriculture, Food and the Marine (DAFM). DAFM have a number of programmes including both vaccination and culling strategies which is outside of the scope of this application.

3.29.8 *Forestry, Hedgerows and Habitat Loss*

A number of submissions were made in relation to hedgerows and habitat loss.

Vegetation removal will be limited to that required to facilitate the Proposed Project, with retained vegetation protected in accordance with the measures outlined within the EIAR. Where tree or woodland removal requires consent under the Forestry Act 2014, the appropriate Tree Felling Licence will be obtained from the Department of Agriculture, Food and the Marine prior to undertaking such works.

It is acknowledged in Chapter 6 - Biodiversity of the EIAR that there are permanent, residual effects at a local geographic scale as a result of the loss of hedgerows and treelines. The hedgerows vary in structure from dense and unmanaged to gappy and scrub like. Typical hedgerow height is between 2-5 m. The treelines recorded are predominantly dense, continuous and unmanaged with a height of 5-10 m. Mitigation and enhancement measures outlined in Chapter 6 - Biodiversity of the EIAR propose planting of 2.2 km hedgerows/treelines within the proposed wind farm site boundary. Hedgerow removed at the proposed TDR works at Sharavogue crossroads will be replanted.

Any species being replanted will be on the 'favourable' list of 'native tree, shrub and climbers' outlined in Appendix D of the Heritage Council's 'Best Practice Guidance on Hedgerow Surveying, Data Collation and Appraisal' (Foulkes et al., 2013)⁴³. Furthermore, all species being replanted will be sourced locally where possible. The species selected will be native and include Hawthorn, Blackthorn, Alder, Grey Willow, Elder, Holly, Hazel, Spindle, Sessile Oak, and Rowan. Post-construction compliance reports will include hedgerow surveys of these newly established habitats, providing recommendations for maintenance and enhancement as needed. The new habitats will be managed for biodiversity and maintained until the end of the Operation Phase (35 years), or until they are deemed self-sustaining by the ECoW.

Removal of any vegetation would take place during the non-breeding season (to avoid nesting birds where possible). Mitigation has been proposed to protect any breeding birds, with any vegetation removal that is required during the breeding season subject to a nesting bird check to ensure there are no breeding birds are present. Where any nesting birds are present, consultation will be undertaken with the National Parks and Wildlife Service (NPWS).

3.29.9 *Invasive Species*

A number of submissions were made in relation to Canadian Pondweed. Canadian Pondweed is no longer listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I 477 of 2011). Canadian Pondweed was illustrated within Figure 6-5 of Chapter 6 – Biodiversity but was not included within the assessment text as it is not currently listed on the Third Schedule. As such, it does not carry the same statutory reporting requirements as Parrots-feather or Himalayan Balsam.

3.29.10 *Ecological Survey and Assessment Adequacy*

Based on Chapter 6 - Biodiversity, the ecological survey and assessment work is comprehensive, methodologically sound, and appropriate for the scale and nature of the Proposed Project. The surveys were undertaken by suitably qualified and experienced ecologists and involved a multi-year and multi-seasonal survey programme, and adherence to established national and

⁴³ Foulkes, N., Fuller, J., Little, D., McCourt, S., Murphy, P. (2013). Hedgerow Appraisal System – Best Practice Guidance on Hedgerow Survey, Data Collation and Appraisal. Woodlands of Ireland, Dublin, Unpublished Report.

international best-practice guidance. The assessment of effects is structured and proportionate to the sensitivity of the identified Key Ecological Receptors (KERs).

3.30 ORNITHOLOGY

3.30.1 *Response to Third-Party Submissions*

3.30.1.1 *Adequacy of Ornithological Survey, Including Spatial and Temporal Coverage*

Summary:

Concerns were raised in a number of submissions regarding the adequacy of the ornithological survey programme and the extent to which it accurately characterised bird usage of the Proposed Project site. Several objectors considered the survey methodology to be insufficient, arguing that surveys were concentrated during daylight hours and failed to adequately capture dawn, dusk, nocturnal and migratory activity. In particular, submissions highlighted the absence of nocturnal and acoustic surveys for species such as Barn Owl and Merlin and questioned whether important movement patterns associated with swans, geese, Golden Plover, Curlew and other waterbirds had been adequately recorded. Concerns were also raised regarding the spatial coverage of the surveys, with some submissions suggesting that parts of the site, including areas surrounding individual turbine locations, were not adequately represented within the survey programme. Consequently, a number of objectors considered the baseline data to be incomplete and the conclusions of the ornithological assessment to be insufficiently supported.

Response:

The ornithological baseline was established through surveys undertaken by third-party ornithologists under the guidance of Ecology Ireland, with additional survey work subsequently undertaken by TOBIN. It is acknowledged that the spatial coverage of the earlier Ecology Ireland surveys was limited in parts of the Proposed Project site. The additional TOBIN survey season provided further coverage of the site and supplemented the existing dataset, although it is recognised that this additional coverage represents a single survey season.

The spatial distribution of flight activity was also considered in the assessment. Important bird flight corridors were identified, including movements associated with the Little Brosna River and the area to the north of the Proposed Project. These areas were therefore not overlooked in the assessment. While the extent and quality of survey coverage varied across the site, the available observations provided information on the principal areas of bird movement within and surrounding the Proposed Project.

As stated in Appendix 1 to this report, the collision risk model identified and quantified uncertainty factors that are inherent in process and specific to the project. When necessary, additional analyses were undertaken to reduce uncertainty, including assessment of distance effects, sampling effects, and avoidance rates. Furthermore, the collision risk model explicitly informs of any self-identified data gaps or limitations and quantifies them accordingly.

The survey programme also did not include dedicated nocturnal surveys or targeted surveys for certain nocturnal species such as Barn Owl or scarce/difficult to survey species, such as Merlin. These limitations are acknowledged. However, the assessment of these species did not rely solely on the absence of records from the field surveys and was informed by available desk-

study information, consultation, habitat appraisal and published information on species ecology and sensitivity.

The additional survey work undertaken by TOBIN, together with the existing Ecology Ireland dataset and supporting desk-study and consultation information, therefore provided a broader evidence base for the assessment than the original survey dataset alone. While some uncertainty remains in relation to the spatial and temporal representation of bird activity, particularly at lower flight heights, during dawn and dusk and for nocturnal species, these limitations were recognised within the assessment and are further detailed in **Appendix 1**.

On this basis, it is considered that the available information provides a sufficient and proportionate basis for assessing the likely ornithological effects of the Proposed Project. The conclusions of the submitted Chapter 7 - Ornithology therefore remain unchanged.

The GBWAG submission correctly states that in three of the eight Ecology Ireland survey seasons less than the recommended 36 hours of survey effort per VP was completed. It also points out that no surveys were carried out in the summer of 2022. However, the NatureScot vantage point survey guidance (NatureScot 2025a) requires four seasons (two summers and two winters) of vantage point surveys with a minimum of 36 hours per VP in each season; it does not require the survey seasons to be consecutive. The overall survey effort at Ballincor therefore meets these requirements.

3.30.1.2 Barn Owl

Summary:

A number of submissions were received around Barn Owl and its occurrence within the area of the Proposed Project. In summary, the received submissions highlight Barn Owls are known to breed in high numbers in the area, including close to the Proposed Project site. Submissions also noted that the species is nocturnal and that the daytime survey programme was incapable of establishing how these birds use the site, particularly their movements between breeding/roosting sites and hunting areas. Consequently, the submissions consider that the absence or low number of Barn Owl observations cannot support the conclusion of negligible/insignificant collision risk, and that both collision and construction/habitat effects may have been underestimated.

Response:

Concerns regarding the Proposed Project's impact on Barn Owl have been acknowledged. These include the presence of breeding pairs in the surrounding area, the proximity of reported breeding locations to proposed turbines, and the absence of dedicated nocturnal surveys. Barn Owl is noted as a species of conservation importance in the wider area, and its predominantly nocturnal behaviour limits the effectiveness of conventional field survey methods for assessing its site use. These limitations have been highlighted under the constraints section of Chapter 7 - Ornithology 7 (section 7.2.8).

The assessment did not rely solely on field survey data. To account for limited direct evidence, the evaluation integrated data from the Development Applications Unit (DAU), National

Biodiversity Data Centre (NBDC), and Lusby et al. (2022)⁴⁴. Additionally, Ecology Ireland consulted with BirdWatch Ireland via Dr John Lusby to identify local breeding sites. This data was weighed alongside habitat appraisals, desk studies, and published literature on Barn Owl ecology and disturbance sensitivity.

While the assessment acknowledged that Barn Owls might forage in the wider area, available evidence did not indicate regular or significant use of the proposed turbine locations, particularly at rotor-swept height. The lack of dedicated nocturnal surveys was explicitly treated as a data limitation rather than proof of absence. Instead, the assessment adopted a precautionary approach, drawing on the available survey, consultation, desk-study and habitat information and applying conservative assumptions where uncertainty remained. On this basis, it was considered that the available evidence was sufficient and proportionate to assess the potential effects of the Proposed Project on Barn Owl.

Regarding the breeding location situated near to some of the proposed turbines, the proximity of a breeding site does not, in itself, establish that birds associated with that site regularly use the turbine locations or that such use would result in a significant collision risk. The assessment therefore considered the potential relationship between known breeding locations, suitable foraging habitat and the Proposed Project rather than treating proximity alone as evidence of a significant effect.

On the basis of the information available, including consultation undertaken specifically to address the limited direct survey records, it is considered that the potential effects of the Proposed Project on Barn Owl have been proportionately assessed. While some uncertainty remains due to the predominantly nocturnal behaviour of the species, this uncertainty has been recognised within the assessment. The conclusions of the submitted Chapter 7 - Ornithology therefore remain unchanged, and significant effects on Barn Owl are not anticipated.

3.30.1.3 Whooper Swan and Other Wetland/Waterbird Species

Summary:

Concerns were raised in a number of submissions regarding the use of the Proposed Project site and surrounding area by Whooper Swan and other wetland and wader species. Objectors referred to regular or significant use of the area by Whooper Swan, Curlew, Lapwing, Golden Plover, Snipe, geese and other waterbirds, including hundreds of Whooper Swan reportedly wintering in fields adjacent to proposed turbine locations and using the river and associated wetlands for nesting, feeding and movement. Concerns were also raised that the importance of the area for these species has been underestimated, with some objectors arguing that species such as Curlew and Snipe were not given adequate individual consideration despite their conservation status and reported breeding use of the wider area. Particular concern was expressed regarding the potential for turbine collisions and displacement of wintering and breeding birds, as well as the potential effects of turbine operation on species behaviour, including Snipe breeding displays. One submission also highlighted observations of Pintail outside its expected wintering period, together with Wigeon, Teal and Shoveler, as evidence that the area may provide suitable feeding habitat for waterbirds beyond the periods identified in the assessment. Overall, objectors considered that the use and functional importance of the

⁴⁴ Lusby, J., Purcell, D. & Franks, D. (2022). Barn Owl population status and trends in County Offaly. BirdWatch Ireland.

site and surrounding wetlands for Whooper Swan and other wetland and wader species had been underestimated and that the potential for collision, disturbance and displacement had consequently not been adequately assessed.

Response:

The occurrence of wetland and waterbird species within the wider landscape, including the Little Brosna River corridor, associated callows and surrounding agricultural land, was recognised within Chapter 7 - Ornithology. The assessment considered the available field survey data alongside desk study information, habitat availability and species ecology in evaluating the potential for interactions between these species and the Proposed Project.

It is acknowledged that the survey programme did not provide comprehensive coverage of all periods of the day, particularly dawn and dusk, and that this represents a limitation when considering species such as Whooper Swan which may undertake movements between roosting and feeding areas during these periods. However, the ornithological baseline was not derived from a single survey season or a limited period of observation. The available dataset comprises nine survey seasons, providing a substantial body of information on bird use of the Proposed Project site and surrounding area across different seasons and years. While this does not eliminate uncertainty or provide a complete representation of all bird movements, it provides a reasonable indication of the species present and their use of the area over the survey period. The lack of dawn/dusk surveys during the survey period was acknowledged and how it was addressed was discussed within the collision risk model and in **Appendix 1** of this report.

The additional survey work undertaken by TOBIN during 2025/2026 further supplemented the existing baseline and provided more recent information on wintering bird activity. This data was considered alongside a desk study and habitat information. Consequently, the limitations associated with the timing and coverage of individual surveys do not mean that bird use of the area was wholly uncharacterised.

A number of submissions also referred to observations of Whooper Swan within fields surrounding the Proposed Project and expressed concern regarding potential movements between feeding and roosting areas. These observations are recognised as relevant to understanding the wider use of the area. However, observations of birds within the wider landscape do not, in themselves, demonstrate regular use of the proposed turbine locations or establish that the Proposed Project site provides functionally important habitat for the relevant population. The assessment therefore considered the available evidence in the context of the wider distribution of suitable habitat and the potential pathways for effects arising from the Proposed Project.

Similarly, observations of other wetland and waterbird species, including Curlew, Snipe and Pintail, provide useful additional information regarding the wider bird assemblage. However, individual or occasional observations, including records outside the typical seasonal period for a species, do not necessarily demonstrate a regular pattern of use or establish that the Proposed Project would adversely affect the conservation status of the relevant population.

On this basis, while the limitations of the survey programme are acknowledged, it is considered that the combination of nine survey seasons, additional survey work, desk study information, habitat assessment and consideration of species ecology provides a proportionate evidence base for the assessment of potential effects on Whooper Swan and other wetland and waterbird

species. The observations raised in the submissions do not alter the conclusions of the submitted Chapter 7 - Ornithology.

3.30.1.4 Collision Risk Modelling and Assessment

Summary:

Concerns were raised in a number of submissions regarding the robustness of the collision risk modelling and the conclusions of the ornithological assessment. Submissions questioned whether the assessment adequately captured bird activity within the study area, particularly during dawn, dusk and nocturnal periods, and suggested that collision risk may therefore have been underestimated. Specific concerns were raised regarding the omission of certain species and areas from the collision risk assessment, including areas considered by objectors to support the highest levels of bird activity and flight corridors associated with the Little Brosna River and adjacent callows. Additional concerns related to the treatment of Barn Owl and SPA-associated species, with objectors questioning whether species-specific assessments had been undertaken where required and whether the assessment adequately reflected known movement patterns between feeding, roosting and nesting areas.

Response:

The concerns regarding the adequacy of the underlying survey data used to inform the collision risk assessment, particularly in relation to dawn, dusk and nocturnal activity is noted and addressed in **Appendix 1** to this report. As discussed in previous sections, the survey programme did not provide comprehensive coverage of all periods of the day, which represents a limitation when assessing species that may undertake regular movements during these periods.

However, the ornithological baseline was informed by nine survey seasons undertaken between 2020 and 2026. While some uncertainty remains regarding the representation of dawn, dusk and nocturnal movements, the available information provides a substantial body of evidence on bird use of the Proposed Project site and surrounding area across multiple seasons and years.

The Collision Risk Modelling Report, presented in Appendix 7-2 of Chapter 7 - Ornithology, clearly outlines the methodology adopted for the assessment and provides the rationale for the inclusion or exclusion of individual species and survey areas within the collision risk modelling process. Species selection was based on established assessment criteria, including abundance, observed flight activity and the potential for interaction with the Proposed Project. Similarly, the selection of areas included within the assessment was informed by the available survey data and the distribution of recorded bird activity within the study area.

The assessment also incorporated additional sources of information beyond the field survey data alone, including desk-study information, habitat appraisal, consultation with relevant stakeholders and published literature. This was particularly important for species such as Barn Owl, where the assessment did not rely solely on direct observations recorded during field surveys.

While limitations associated with the survey programme are acknowledged and have been explicitly recognised throughout the assessment, these limitations do not invalidate the collision risk modelling or the broader ornithological assessment. The methodology, assumptions and species selection criteria applied throughout the assessment are fully documented within the submitted Chapter 7 - Ornithology and supporting appendices.

On this basis, it is considered that the collision risk assessment provides a sufficient and proportionate evaluation of the potential effects of the Proposed Project, and the conclusions of the submitted Chapter 7 - Ornithology therefore remain unchanged. A full response to submission on the CRM is included in **Appendix 1**.

3.30.1.5 Cumulative Effects and Collision/Barrier Risk

Summary:

Concerns were raised in a number of submissions regarding the potential for cumulative effects arising from the Proposed Project in combination with other existing and proposed wind energy developments in the wider area. Particular concern was expressed regarding the potential cumulative collision risk for Golden Plover, with submissions highlighting the predicted annual mortality estimates presented within the assessment and noting the unfavourable conservation status of the species. Concerns were also raised regarding the potential for cumulative effects on Whooper Swan, including the creation of barrier effects between roosting and feeding areas and the potential disruption of established movement corridors between the River Little Brosna Callows SPA and the wider landscape. Additional concerns related to the cumulative effects on White-tailed Eagle and the potential for multiple wind farms to collectively increase collision risk for protected bird species. One submission also referred to the Little Brosna River as an important bird movement corridor and raised concerns regarding the wider ecological effects of the Proposed Project.

Response:

The potential for cumulative effects was examined as part of the submitted ornithological assessment. The potential for interactions between the Proposed Project and other existing, consented and Proposed Projects within the wider study area, were considered in terms of potential for cumulative collision risk, disturbance, displacement and barrier effects, in line with relevant guidance as outlined in section 7.12 of the submitted Chapter 7 Ornithology.

With regard to Golden Plover, the cumulative collision risk assessment and the associated mortality estimates are presented in the Collision Risk Modelling Report contained within Appendix 7-2 of Chapter 7 - Ornithology and further discussed in **Appendix 1**. The assessment considered the predicted level of mortality in the context of the relevant population and the available evidence regarding the conservation status of the species. When examined against the collision risk models and assessment of other relevant projects, it was determined that no cumulative effects were envisaged.

Concerns relating to Whooper Swan primarily focus on the potential for cumulative collision and barrier effects associated with multiple wind farms within the wider landscape. The River Little Brosna and associated callows were recognised within the assessment as important movement corridors for a range of wetland bird species, including Whooper Swan. The potential for displacement and barrier effects was therefore considered within Chapter 7 - Ornithology. Flight activity associated with the River Little Brosna corridor was recorded during the survey period, however, these movements were typically associated with the river corridor itself and did not generally coincide with the proposed turbine locations. Consequently, the recorded flight activity was not considered likely to result in a significant increase in collision risk. Furthermore, while the potential for barrier effects associated with the wider turbine array was considered, the available information did not indicate that the Proposed Project, either

individually or in combination with other developments, would result in the disruption of established movement patterns between important roosting and foraging areas.

Concerns were also raised regarding the potential for cumulative effects on White-tailed Eagle. The cumulative assessment was undertaken in accordance with the relevant guidance and considered existing, permitted and Proposed Projects within the wider study area. As outlined in **Appendix 1**, an occurrence of White-tailed Eagles in a vantage point surveys, does not indicate that the site supports a discrete local population, due to the species high mobility. The methodology, assumptions and developments included within the assessment are described in detail within the cumulative effects assessment presented within the submitted Chapter 7 - Ornithology.

While the submissions provide additional observations and concerns regarding cumulative effects on a number of protected bird species, the cumulative assessment presented within Chapter 7 - Ornithology considered the relevant pathways through which cumulative effects could arise and was undertaken in accordance with the relevant guidance. On this basis, the conclusions of the submitted Chapter 7 - Ornithology remain unchanged.

3.30.1.6 Effects on SPA Qualifying Interests and Connectivity

Summary:

Concerns were raised in a number of submissions regarding the potential effects of the Proposed Project on the Special Conservation Interests (SCIs) of nearby SPAs, particularly the River Little Brosna Callows SPA and Dovegrove Callows SPA. Objectors questioned whether all relevant SCI species had been adequately considered within the assessment, specifically highlighting Greenland White-fronted Goose, Pintail and Black-tailed Godwit. Concerns were also raised regarding the classification of certain species, with objectors arguing that species such as Pintail were incorrectly characterised as winter visitors and that recurring observations had been inappropriately treated as isolated events.

Several submissions also highlighted the importance of the River Little Brosna as a movement corridor connecting SPA habitats and adjacent feeding areas and expressed concern that the survey programme did not adequately capture nocturnal and dawn/dusk movements of key SPA species. Consequently, objectors questioned the robustness of the collision risk assessment and the conclusions relating to displacement, barrier effects, habitat avoidance and functional connectivity.

Additional concerns were raised regarding the scale of the assessment, with objectors suggesting that potential effects on SPA populations had been considered too narrowly and that in-combination and cumulative effects with other developments had not been adequately assessed. On this basis, objectors considered that adverse effects on the integrity of nearby SPAs could not be excluded beyond reasonable scientific doubt.

Response:

The potential for effects on nearby SPAs and their associated SCI species was considered in detail within both the Chapter 7 - Ornithology and the NIS submitted as part of the application. The assessment considered the ecological characteristics of each designated site, the relevant SCI species, the availability of suitable habitat within the Proposed Project site and surrounding landscape, and the potential pathways through which effects could arise.

The River Little Brosna and associated callows were recognised within the assessment as important wetland habitats that support a range of wintering and migratory bird species. Potential ecological connectivity between these habitats and the Proposed Project site was therefore considered, including the potential for bird movements between roosting, feeding and nesting areas.

Concerns were raised regarding the omission or treatment of particular SCI species, including Greenland White-fronted Goose, Pintail and Black-tailed Godwit. The rationale for the inclusion or exclusion of individual species within the assessment is clearly described within the submitted Chapter 7 - Ornithology and supporting CRM appendix. Species selection was informed by desk-study information, field survey data, published information on species ecology and the potential for interaction with the Proposed Project.

It is acknowledged that concerns have been raised regarding the extent to which the survey programme captured dawn, dusk and nocturnal movements of certain species, particularly those associated with nearby SPAs. As discussed previously, these limitations are recognised within the assessment. However, the assessment did not rely solely on field observations and also incorporated desk-study information, habitat appraisal, consultation and published literature.

Similarly, concerns relating to collision risk modelling, displacement, barrier effects and cumulative effects have been addressed within separate sections of this response document and are discussed in detail within the submitted Chapter 7 - Ornithology and NIS.

The assessment of effects on European sites was undertaken in accordance with the precautionary principle and considered the relevant conservation objectives of each SPA. The conclusions presented within the NIS were based on the available evidence and the relevant assessment methodologies. On this basis, the conclusions of the submitted Chapter 7 - Ornithology and NIS remain unchanged.

3.30.1.7 Data Transparency

Summary:

Concerns were raised regarding the transparency of the ornithological survey data underpinning the assessment, particularly the VP survey data used to inform the CRM. Objectors noted that, although the EIAR describes the survey programme and seasons covered, the supporting survey records, including individual survey dates, start and finish times, observers, weather conditions and raw flight-line data, were not included.

It was argued that the absence of this information prevents independent verification of the survey effort, temporal coverage, viewshed coverage and the completeness of the flight activity data used in the CRM. These concerns were considered particularly relevant given the limitations acknowledged within the EIAR regarding the Ecology Ireland dataset and the subsequent interpretation and standardisation of the data prior to modelling.

Response:

It is acknowledged that the submission did not include the full supporting VP survey effort information, including the individual survey dates, start and finish times, observer details and prevailing weather conditions. It does not, however, demonstrate that the survey effort did not occur or establish that the underlying survey dataset or CRM conclusions are unreliable. The

ornithological assessment was informed by a multi-season survey programme comprising nine survey seasons undertaken, with the majority of the survey effort undertaken between April 2020 and September 2024 and additional survey undertaken during winter 2025/2026. The survey methodology, survey locations, periods covered, species recorded and limitations associated with the survey data are described within the submitted Chapter 7 - Ornithology and supporting documentation. Flightlines and survey data for relevant KORs has also been provided within Appendix 7.1 of the Chapter 7 Ornithology.

Also as discussed above, the limitations identified within the Ecology Ireland dataset are also acknowledged within Section 7.2.8 of the Chapter 7 Ornithology. These limitations were recognised during preparation of the CRM, with the available data requiring interpretation and standardisation prior to modelling. These matters were therefore considered in the preparation and interpretation of the CRM and are not being presented as having been absent or otherwise unrecognised.

While the supporting survey records were not submitted, the substantial body of multi-season survey data, together with the stated limitations and methodology presented within the submitted Chapter 7 - Ornithology and CRM report, remains the basis for the assessment. KOR species data and sightline mapping is provided in Appendix 7-1. The conclusions regarding the likely effects of the Proposed Project therefore remain unchanged.

3.30.1.8 Other Ornithological Matters

Summary:

Concerns were raised in a number of submissions regarding species records that were not captured during the survey programme and the extent to which the ornithological assessment reflects the diversity and complexity of bird communities within the wider area. Several objectors provided additional records of species observed within and adjacent to the Proposed Project site, including Cormorant, Kingfisher, Cuckoo, Curlew, Buzzard, Woodpecker, Pheasant, Wigeon, Whinchat, Snipe, Starlings, Swallow, Kestrel and Merlin. In particular, submissions highlighted observations of breeding or nesting birds that were not identified during the field surveys, including reports of a Cormorant nest near Turbine T8, breeding Snipe and Whinchat within the project footprint, breeding Swallows and a breeding pair of Kestrels in close proximity to the Proposed Project.

Several submissions also questioned the rationale used to determine which species were subject to individual assessment, arguing that species had been excluded despite evidence of their occurrence within the wider area. More generally, objectors considered that the ornithological assessment did not adequately characterise the ecological complexity of the site and surrounding landscape and that gaps in the survey programme limited the ability of the assessment to identify all relevant species and their patterns of habitat use.

Response:

The additional species observations provided within the submissions are acknowledged and provide further information regarding bird use within the Proposed Project site and the surrounding landscape. However, the occurrence of a species within or adjacent to the site does not, in itself, indicate that significant effects will arise or that an individual species requires a separate assessment.

As outlined in the submitted Chapter 7 - Ornithology, the assessment identified a suite of Key Ornithological Receptors (KORs) that were considered based on a combination of factors, including conservation status, the frequency and abundance of records during the survey period, species ecology, habitat associations and the potential for interaction with the Proposed Project. The rationale underpinning the selection of KORs is described within the Chapter 7 - Ornithology and supporting appendices.

Consequently, not all species recorded within the study area were subject to individual assessment. Species considered unlikely to be significantly affected by the Proposed Project, including species with limited potential for interaction with the turbine envelope or associated infrastructure, were considered within the broader ornithological assessment rather than through species-specific evaluation.

Several submissions refer to observations of breeding territories or nesting locations that were either not recorded during the survey programme or were considered to have been overlooked. These additional observations have been reviewed as part of this response. With regard to the breeding Kestrel territory identified in the submissions, it is noted that this nest location was recognised and described within the submitted Chapter 7 - Ornithology. Therefore, the information provided does not represent a previously unidentified receptor.

Similarly, observations of species such as Cormorant, Whinchat, Snipe and Swallow provide additional information regarding the use of the wider landscape by individual species. However, these observations do not necessarily demonstrate regular use of the proposed turbine locations or establish a pathway through which significant effects would occur.

Concerns relating to the potential effects of turbine noise, air pressure and disturbance on bird behaviour were considered within the broader assessment of disturbance and displacement effects presented within Chapter 7 - Ornithology.

While the submissions provide additional observations regarding the occurrence and distribution of several bird species within the wider area, these records do not materially alter the evidence base underpinning the ornithological assessment. On this basis, the conclusions of the submitted Chapter 7 - Ornithology remain unchanged.

APPENDIX 1 – CRM COMMENTS

4. COLLISION RISK MODELLING

4.1 SURVEY NON-COMPLIANCE AND QUALITY OF THE VP DATASET

The Ecology Ireland surveys had methodological problems and these are explicitly acknowledged in the CRM report. The Greater Birr Wind Action Group (GBWAG) submission correctly refers to many of these problems but largely ignores the adjustments that were made in the modelling techniques to address these issues.

The adjustments made included:

- running models both with all survey data and with non-compliant watches removed, and taking the higher result;
- reducing effective survey effort where substantial time was spent tracking birds outside the viewshed;
- removing overlapping viewshed areas to address double counting;
- adjusting flight durations where flightlines crossed viewshed boundaries; and
- adopting precautionary assumptions for missing flight-height and duration information.

Where adjustments were not possible (e.g. the lack of dawn and dusk coverage), the issues were highlighted in the discussion of uncertainty.

The submission argues that because the surveys departed from NatureScot guidance the CRM is unreliable. However, the relevant question is whether, after the identified survey deficiencies and the adjustments made to accommodate them are taken into account, is there a credible residual bias that is likely to materially underestimate collision risk. The submission also misrepresents some of the ways that the vantage point survey data were processed and raises additional supposed deficiencies that appear to reflect misunderstandings of the rationale behind the vantage point survey methodology.

Specific issues raised in the submission about the survey non-compliance are discussed below.

4.2 SEASONAL COVERAGE

The GBWAG submission correctly states that in three of the eight Ecology Ireland survey seasons less than the recommended 36 hours of survey effort per VP was completed. It also points out that no surveys were carried out in the summer of 2022. However, the NatureScot vantage point survey guidance (NatureScot 2025a) requires four seasons (two summers and two winters) of vantage point surveys with a minimum of 36 hours per VP in each season; it does not require the survey seasons to be consecutive. The overall survey effort at Ballincor therefore meets these requirements.

4.3 CONCURRENT VP WATCHES

4.3.1 *Ecology Ireland VP watches*

The GBWAG submission refers to the issue of concurrent watches of the Ecology Ireland vantage points and quotes the CRM report stating that this “created significant issues for the statistical independence of the flight activity sampled at each vantage point”.

The concurrent watches created a genuine analytical problem because, where VPs had overlapping viewsheds, the simultaneous sampling of the same areas violated the independence assumptions underlying the VP averaging procedure used to calculate mean flight activity densities. However, the CRM explicitly dealt with this issue by constructing non-overlapping viewsheds, allocating overlapping areas between VPs and adjusting mapped flightline durations accordingly. These procedures are described in the CRM report.

The GBWAG submission does not acknowledge the efforts made by the CRM to deal with this issue, or engage with the method used, but instead simply treats the overlap as evidence that the CRM was flawed.

4.3.2 Concurrence with other survey work

The GBWAG submission also raises another issue: concurrence between vantage point watches and other ecological survey work taking place on the site. It gives an example of one instance where this occurred, but other instances may also have occurred.

Section 3.8.1 of the NatureScot guidance states that VP surveys should not take place simultaneously with other fieldwork on the site because of the potential for disturbance to affect bird activity and invalidate the VP survey results. The identification of temporal overlap between VP watches and aquatic surveys therefore represents a deviation from the recommended survey methodology. However, temporal overlap alone does not demonstrate that the VP survey results were affected. The significance of any such overlap depends on the location and nature of the concurrent fieldwork and whether it had the potential to disturb birds within the area being observed from the relevant vantage point.

The submission refers to such temporal overlap as a breach of the NatureScot (2025) requirement that VP surveys must not take place simultaneously with any other fieldwork on the site. However, the guidance applicable when these surveys were undertaken (SNH 2017) stated that VP surveys should not take place simultaneously with other fieldwork on the site “that may cause disturbance and invalidate the VP survey results”. While the wording and punctuation of this sentence are somewhat ambiguous, it explicitly identifies disturbance and consequent effects on VP survey results as the concern underlying the recommendation. Therefore, the occurrence of temporal overlap does not, by itself, demonstrate that the VP survey results were compromised. This would depend on the nature and location of the concurrent fieldwork and its potential to disturb birds within the area being observed.

The landscape context is also relevant: disturbance associated with fieldworkers may be significant in remote landscapes where human activity is infrequent and conspicuous, but is likely to be less important in a lowland agricultural landscape where birds are routinely exposed to human activity. There would therefore need to be evidence that the aquatic survey activity was capable of causing sufficient additional disturbance within the relevant VP survey areas to materially affect the recorded flight activity.

4.4 DAWN/DUSK COVERAGE

The lack of dawn/dusk coverage by the Ecology Ireland vantage point surveys is analysed in the CRM report. Its implications for the uncertainty associated with the Whooper Swan and Cormorant collision risk predictions are discussed in Section 4.7.2.5 and referred to in the discussion of overall uncertainty (Section 4.7.5).

The GBWAG submission raises issues about the lack of dawn/dusk coverage in relation to Whooper Swan commuting activity between the Sharragh roost and the River Little Brosna Callows SPA, Greenland White-fronted Goose commuting activity, Curlew display activity, and Golden Plover pre-roost flocking and roost departure.

4.4.1 Whooper Swan commuting activity

The CRM acknowledges that the limited dawn/dusk coverage may have resulted in some underestimation of Whooper Swan flight activity. However, this does not establish the GBWAG submission's more specific contention that commuting movements associated with the Sharragh roost passed through the Ballincor Wind Farm site.

The submission states that commuting activity associated with the Sharragh roost crosses the development Zone of Influence. However, the extent of the Zone of Influence referred to in this statement is unclear, and intersection with a wider Zone of Influence does not demonstrate that commuting flights cross the turbine array or other airspace relevant to collision risk.

The exact location of the Sharragh Whooper Swan roost is not provided in the GBWAG submission and does not appear to be available from public sources. However, it presumably occurs within, or adjacent to, Sharragh townland, while the Carrig Wind Farm EIAR notes that the roost is around 400 m from its red line boundary and 600 m from the nearest turbine. Therefore, the roost appears to be located around 5 km to the north-west of the Ballincor Wind Farm site and around 6 km to the west of the Little Brosna River (Figure 1.1). The River Little Brosna Callows SPA is around 6 km to the north of the presumed roost location. A reasonably direct commuting route between the Sharragh roost and the River Little Brosna Callows SPA would therefore not be expected to pass through the Ballincor Wind Farm site. Nor would such a route be expected to follow the Little Brosna River adjacent to the site.

The submission also refers to the installation of “bird strike deflectors on powerlines in the Sharragh and Lissernane area as a result of repeated whooper swan collisions” (p. 601). Lissernane townland is immediately to the west of Sharragh townland. Therefore, these deflectors do not provide evidence about Whooper Swan commuting activity through the Ballincor Wind Farm site.

Whooper Swan commuting activity was recorded along the Little Brosna River adjacent to the Ballincor Wind Farm site, but there is no apparent basis for attributing this activity to movements between the Sharragh roost and the River Little Brosna Callows SPA.

Other Species

The Ballincor Wind Farm site is at the limit of the likely core foraging range of Greenland White-fronted Geese from the River Little Brosna Callows SPA (5–8 km; SNH 2016), and any geese commuting through the site to areas further away would be travelling even greater distances. Unlike Whooper Swans, wintering Greenland White-fronted Geese are not widely distributed across the Irish countryside but are largely restricted to a small number of traditional wintering sites. While the limited dawn/dusk coverage is a limitation in assessing Greenland White-fronted Goose activity within the wind farm site, the very low number of records across six winters of surveys provides no evidence that the site is regularly traversed by commuting geese.

While breeding Curlew may show increased activity during crepuscular periods, available evidence indicates that their activity is not confined to dawn and dusk and varies through the

day according to behaviour and breeding stage (Ewing *et al.* 2017). Moreover, dawn and dusk surveys are not key requirements of Curlew breeding survey methodologies. For example, of Grant *et al.*'s (2000) three survey visits, two were carried out between 09:00 and 17:00, while the Curlew Recovery Partnership explicitly recommends avoiding the two hours after dawn and before dusk (BTO 2023). The absence of dawn/dusk coverage may therefore have reduced the detectability of some territorial behaviour, but it does not follow that daytime vantage point surveys were ineffective at recording Curlew flight activity. In particular, the assertion that the low number of Curlew records was a "direct consequence" of survey timing is not supported by evidence.

The GBWAG's statement that "pre-roost flocking and roost departure are crepuscular events" presents an overly simple characterisation of Golden Plover behaviour. While arrival at and departure from nocturnal roosts may often occur around dusk and dawn, Golden Plover can feed both by day and by night, and daytime resting and roosting also occur (Gillings *et al.* 2005, 2007). Of particular relevance to the Ballincor landscape, wintering Golden Plover in the Irish midlands appear to regularly use open bog and bare peat as daytime resting or roosting habitat (BES 2013, Fehily Timoney 2026, personal observations of the CRM author), moving between these areas and foraging habitat in nearby fields. Therefore, movements between feeding and resting/roosting areas cannot be assumed to be restricted to crepuscular periods.

4.4.2 Conclusions about dawn/dusk coverage

The limited dawn/dusk coverage of the Ecology Ireland surveys represents a source of uncertainty, particularly for species with substantial crepuscular activity, but it does not necessarily follow that the vantage point dataset systematically failed to record the species identified by GBWAG, materially underestimated their flight activity, or that the resulting collision risk predictions are invalid. The significance of this limitation depends on the ecology, occurrence and recorded activity of each species and, where it was considered potentially important, was addressed qualitatively in the uncertainty assessment in the CRM.

4.5 ENVIRONMENTAL CONDITION DATA

The GBWAG submission highlights the lack of "basic environmental data such as hourly estimates of visibility, glare arcs, cloud cover and precipitation" for the vantage point surveys (and other surveys) in the EIAR and raises issues about how visibility, glare, precipitation and cloud cover may have affected the vantage point surveys.

While it is correct that the details of visibility and weather conditions were not included in the EIAR, this data was available to the CRM author and reviewed as part of the CRM.

4.5.1 Visibility

The Ecology Ireland dataset classified visibility for most of the watches as either excellent, very good, good, moderate, poor or bad. There were a few watches where the visibility was classified as clear, which was assumed to be equivalent to good, or fair, which was assumed to be equivalent to moderate. The watches with visibility classified as moderate, poor or bad were classified as non-compliant watches.

The TOBIN dataset classified visibility on a five-point scale from 0 = no visibility to 4 = good visibility (> 2 km). Watches classified as having less than good visibility were classified as non-compliant watches.

The occurrence of watches with non-compliant visibility conditions is summarised in Section 3.2.3 of the CRM report.

4.5.2 Glare

The GBWAG submission describes the absence of glare arc data as “a gap of particular significance for dawn and dusk coverage” because “glare arcs define the periods within each survey day when low sun angle renders part or all of the viewshed unusable for detection”.

The vantage point survey guidance (NatureScot 2025a) does not identify glare as an issue to be considered in relation to weather conditions and vantage point surveys (see Section 3.8.5 of the guidance) and glare data is not included in the example summary tables in Annex 3 of the guidance.

While glare can be a significant issue for some types of bird surveys (e.g. counting roosting waders in the morning or evening), the nature of vantage point surveys means that it is not likely to have much effect on detectability. When watches are carried out into the sun, there will be a small portion of the survey arc (a few percent of the overall arc) that the observer cannot look at directly due to the sun, while a larger section will be silhouetted so details of plumage will be obscured. However, flying birds can be tracked either side of the non-surveyable section of the arc and target species in the silhouetted section can be identified by “jizz”, or by following the birds until they leave the silhouetted section.

In rare cases, some birds may not be identified to species (due to glare or other issues) and will be recorded as higher taxonomic groupings (e.g. gull species). Section 2.4.3.4 of the CRM report describes how records of non-species taxa were dealt with in the CRM.

4.5.3 Precipitation and cloud cover

The GBWAG submission states that the absence of precipitation and cloud cover data removed the “ability to quantify independently the proportion of survey time conducted in conditions of reduced avoidance capacity”. The submission quotes the NPWS/DAU submission on the Carrig Wind Farm application as identifying this data as material because “low visibility events – such as fog or heavy rain – are likely to greatly reduce the ability of species to avoid danger areas”.

While it is plausible that avoidance rates are affected by factors such as fog and heavy rain, such conditions will usually be unsuitable for vantage point surveys due to incomplete visibility of the viewshed. This is acknowledged in the vantage point survey guidance (NatureScot 2025a), which states that “some bird species will fly in poorer weather conditions, e.g. persistent rain/mist, very strong winds (Beaufort Force 7 or above), but useful observation in such conditions is often difficult and is not recommended”.

The logic behind the GBWAG submission’s position is also unclear. Vantage point surveys are used to estimate flight activity, not avoidance rates. Therefore, the absence of VP coverage during fog or heavy rain would only bias the estimated collision risk through the flight-activity component if flight activity during those conditions differed systematically from that recorded

during surveyable conditions. There is no evidence presented in the submission that the relevant species have higher flight activity during such conditions.

Also, most species-specific avoidance rates are based on comparison between flight activity data from vantage point surveys and post-construction fatality monitoring by carcass searches. The vantage point surveys will be subject to the restrictions on coverage of poor visibility conditions discussed above, while the carcass searches will integrate collisions that occurred under all types of weather conditions. To the extent that poor weather increases collision susceptibility, its effects may therefore already be incorporated in empirically derived avoidance rates.

4.6 FLIGHT HEIGHT CATEGORISATION

The Ecology Ireland surveys did not use height bands for recording flight heights but instead recorded the minimum and maximum flight heights for most records. The CRM used the maximum flight height to categorise flights by whether they occurred at potential collision height, and, where there was no data on maximum flight height, assumed that the flight was at potential collision height (see Section 2.4.3.3 of the CRM report). As noted in the report, this is a very precautionary assumption as for all records where the maximum flight height was within potential collision height, or no maximum flight height was recorded, all of the flight duration was assumed to be at potential collision height, including for records where the minimum flight height was well below potential collision height.

The GBWAG submission refers to the flight heights included in Appendix 7.1 of the EIAR, which it correctly categorises as category midpoints (page 585). However, Appendix 7.1 does not include the full flight height data that was contained within the Ecology Ireland dataset. The heights included in the appendix, while labelled “Initial flight height” in the dataset were actually the midpoints of the minimum and maximum flight heights that were also included in the dataset. Because flight height estimation is necessarily approximate, the minimum and maximum flight heights were usually rounded to the nearest 5 or 10 m (except for very low heights) resulting in the repetition of certain midpoint heights that is noted in the submission.

Later in the submission, the use of precautionary assumptions in the categorisation of flight heights is acknowledged, but not fully explained (p. 595). The submission then characterises reference to these precautionary assumptions as “height overestimation used to downplay results”. However, these precautionary assumptions are only one of many factors potentially biasing the CRM results that is mentioned in the CRM report and other factors that may have caused underestimation of the collision risk predictions (such as the lack of dawn and dusk coverage) are also fully discussed.

4.7 FLIGHT DURATIONS

The GBWAG submission refers to missing durations for a “non-trivial number of records” and claims that “these records contribute neither flight time nor altitude data to the CRM, yet their existence is not accounted for in the uncertainty ranges and the proportion of observed flight activity that could not be quantified is not disclosed” (p. 586). However, the CRM report contains full details of the procedures used to assign durations to these records so that they could be included in the modelling (see Section 2.4.3.3 of the CRM report) so the claim that they contributed “neither flight time nor altitude data to the CRM” is not correct.

The submission also refers to a number of “extreme duration records” that it claims are “not accounted for in the CRM methodology” (p. 586). It is not clear why the submission makes this claim. The CRM included all records where flight activity classified as at potential collision height was recorded within the relevant viewsheds. This included 19 records with total durations of 750–2460 seconds. Of the four records referred to in the submission, the Buzzard and Golden Plover records were included. The Mallard records were excluded as they were below potential collision height.

4.8 VIEWSHEDS

4.9 VIEWSHED ANALYSIS

The GBWAG submission criticises the lack of information about the exact positions of the vantage point locations and claims that the Ecology Ireland viewsheds appear to have been reverse-engineered.

It is not a requirement of the NatureScot guidance to present the exact coordinates of the vantage point locations and this is not standard practice in Irish wind farm EIARs. However, the coordinates are shown in Table 4.1.

Table 4.1. Coordinates of the vantage point locations.

VP	ITM coordinates	
	x	y
EI1	605111	696820
EI2	604510	697330
EI3	603530	698718
EI4	602096	698764
EI5	605776	698692
EI6	603703	699987
EI7	602896	700728
TB1	602895	700721
TB2	603530	698718
TB3	603815	697676
TB4	605111	696820
TB5	604820	697175

While it is correct that the viewsheds for the Ecology Ireland vantage points were generated after the surveys had been carried out, this does not mean that they do not accurately represent what was visible from the vantage points.

Before carrying out the viewshed analyses, the large-scale maps of each vantage point overlain on aerial imagery were produced and sent to Ecology Ireland for verification that the supplied vantage point mapping accurately represented the positions used by the surveyors.

The viewshed arcs supplied by Ecology Ireland represented the 180° arc that was the main focus of survey effort at each vantage point. As noted in the CRM report, these arcs did not align precisely with the VP coordinates. Revised arcs were generated using the azimuths of the supplied arc boundaries, ensuring geometric alignment with the VP locations. Mismatch between mapped VP locations and VP arcs is a common issue with mapping supplied by vantage point surveyors, probably arising from matching the arcs to the VP locations by eye. The mismatches are usually small-scale (a few metres to tens of metres) and do not affect the reliability of the supplied arcs in showing the arcs that were surveyed. Correcting the arcs so that they align with the mapped VP locations is correcting a GIS geometry inconsistency, not inventing new survey coverage retrospectively.

The viewshed analysis carried out as part of the CRM work established the areas within the surveyed arcs that were visible at specified heights above ground level. Therefore this analysis did not retrospectively define survey coverage but, instead, was used to filter the surveyed area for the purposes of the analyses required for the CRM. The viewshed analyses used a combination of Digital Terrain Model (DTM) and Digital Surface Model (DSM) mapping to accurately represent the areas visible at the specified heights above ground level taking account of vegetation and other above-ground visual obstructions.

It is correct that the analysis of the Ecology Ireland vantage point survey data indicated that surveyors spent significant amount of time watching areas outside the arcs. However, this issue was addressed through the correction to the survey durations (see Section 4.1).

The GBWAG submission (p.569) refers to GIS analyses carried out by Dr Moran to demonstrate the sensitivity of the results of the viewshed analyses to variation in observer position and eye-height. However, the details of these analyses are not included in Dr Moran's report. The validation of the exact vantage point locations by Ecology Ireland (see above) addresses the first point. The viewshed analyses used an eye-height of 1.65 m, which is the mean eye-height of an Irish adult male (all the Ecology Ireland surveyors were male). Variation of a few centimetres in eye-height will not appreciably affect viewshed coverage at the scale relevant to collision risk modelling, where vantage points are selected to provide good visibility over long ranges and to avoid nearby visual obstructions.

4.10 VIEWSHED COVERAGE

The GBWAG submission refers to the lack of viewshed coverage of some of the turbine locations, which it describes as a "critical gap". This misunderstands the nature of vantage point surveys, which are designed to sample flight activity, not to provide comprehensive coverage of all flight activity. Indeed, comprehensive temporal coverage is clearly impossible, as the standard survey effort samples only around 1.5–2% of daylight hours. This sampling approach is reflected in the NatureScot CRM methodology, which uses vantage point survey data to estimate mean flight activity densities across the site, or across defined sections of the site when spatial structure needs to be taken into account, rather than generating separate flight activity densities for individual turbine locations. Therefore, the important consideration is whether the

viewsheds provide representative spatial sampling of flight activity across the relevant parts of the site, rather than whether the exact locations of every turbine are within a mapped viewshed.

This was generally the case for both the Ecology Ireland and TOBIN viewsheds. The position of T6, around 200 m outside the Ecology Ireland 17 m viewsheds and in a marginal area relative to their overall 17 m viewshed coverage, was the weakest part of the viewshed coverage. However, given the distribution of habitats and recorded flight activity across the site, and the absence of any identified concentration of flight activity in this area, this localised gap is unlikely to have materially affected the reliability of the CRM predictions.

The GBWAG submission also criticises the lack of viewsheds covering heights below 17 m, referring to “the low commuting heights at which Whooper Swan in particular habitually move between roosting and foraging sites”. No citation or other evidence is provided to support this characterisation of Whooper Swan commuting flight heights. More importantly, for collision risk modelling purposes, flight activity below the minimum ground clearance of the turbines does not contribute to collision exposure. Such low-level flight activity may be relevant to other aspects of the ornithological assessment, but it is not necessary for the viewsheds used in the CRM to provide comprehensive visibility below the potential collision height zone. Furthermore, the absence of mapped viewsheds below 17 m does not mean that flight activity below this height was not visible or recorded: substantial low-level flight activity was recorded in those parts of the survey area where visibility permitted it.

4.11 NOCTURNAL SURVEYS

The GBWAG submission criticises the lack of nocturnal surveys.

Nocturnal surveys can be useful in identifying qualitative differences between daytime and nighttime activity patterns and would have provided useful additional information on nocturnal bird activity at Ballincor. In particular, they can help to identify species for which nocturnal activity may be substantially greater than would be apparent from daytime surveys, and can provide information relevant to assigning nocturnal activity rankings. However, the data generated by nocturnal survey methods are generally not directly comparable with conventional vantage point survey data and cannot simply be incorporated into the standard collision risk modelling as additional flight activity data.

For collision risk assessment, the importance of nocturnal surveys is therefore greatest where a species recorded infrequently during daytime surveys may nevertheless have substantial nocturnal activity. Where high levels of daytime activity are already recorded, as was the case for Golden Plover at Ballincor, nocturnal surveys could provide additional information on the relative level of nocturnal activity.

However, the collision risk model already makes an allowance for nocturnal activity through the application of nocturnal activity rankings. The nocturnal activity rankings used in the Ballincor CRM were based on published literature. The use of such rankings derived from literature sources is a standard part of the NatureScot collision risk modelling methodology and is now applied in most collision risk modelling carried out for Irish onshore wind farms.

The uncertainty associated with these rankings was explicitly included in the uncertainty analysis by increasing or decreasing each ranking by one unit (equivalent to $\pm 25\%$). Across the

species modelled, this produced potential variation in the predicted collision risks of around 10–30%.

4.12 THE BROSNA CORRIDOR

The basic NatureScot CRM methodology assumes that the flight activity recorded from each vantage point provides a representative sample of flight activity within its viewshed, which can then be averaged across vantage points to estimate flight activity density within the wind farm. Where there is substantial spatial structure in flight activity, this needs to be taken into account in the modelling.

In line with this approach, the Ballincor CRM used spatially-structured models for several target species where there was substantial variation in flight activity densities across the site. Much of this variation was associated with high densities of flight activity in a narrow corridor along the Little Brosna River (see Maps 3.3–3.13 in the CRM report). This was accommodated by defining a 500 m wide corridor along the river, divided into northern and southern sections to reflect differences in flight activity densities between the two areas. The Brosna North Corridor did not contain any turbines and was therefore excluded from the collision risk calculations.

4.12.1.1 *Brosna North Corridor*

The GBWAG submission criticises the exclusion of flight activity in the Brosna North Corridor on the basis that birds using this corridor “commute south — through or over the wind farm footprint — to reach the South Corridor feeding grounds, the wider landscape, and their roost sites”. However, this criticism appears to misunderstand how flight activity density is calculated and how flightlines crossing between the spatial divisions were treated in the CRM.

Firstly, the much higher flight activity densities recorded in the Brosna North Corridor do not imply that equivalent levels of flight activity should have been applied elsewhere in the site. Flight activity density is expressed per unit area. Therefore, even if the same birds used both the Brosna North Corridor and other parts of the site, substantially higher densities could occur within the corridor because their activity was concentrated within its much smaller area.

Secondly, there is no basis for assuming that all, or even most, of the activity recorded within the Brosna North Corridor subsequently passed through the rest of the site. As noted in the CRM report, much of this activity was associated with birds using flooded grasslands within the corridor. Furthermore, where birds using the Brosna North Corridor commuted to or from areas to the north, their movements would not take them through the remainder of the wind farm site.

Most importantly, movements between the Brosna North Corridor and other parts of the site were not excluded from the analysis. Flightlines crossing between spatial divisions were split between those divisions, with their recorded durations allocated in proportion to the flightline occurring within each section. Therefore, any recorded movement from the Brosna North Corridor into the Brosna South Corridor or other parts of the wind farm site contributed to the flight activity density calculated for those areas. Excluding the component of those flightlines occurring within the turbine-free Brosna North Corridor did not exclude their subsequent movement through areas containing turbines.

4.12.1.2 Brosna South Corridor

The GBWAG submission also criticises the fact that, for some species where spatially-structured modelling was used, the Brosna South Corridor was combined with the remainder of the site. It claims that this “understates the specific exposure” at the turbines within this corridor.

The spatial divisions used in the CRM were not applied automatically to every species. Candidate divisions were first defined from the observed distributions of flight activity, and mean flight activity densities were then calculated for each division (Table 3.4 of the CRM report). Spatial divisions were retained in the collision risk model where these analyses indicated that they represented meaningful concentrations of flight activity.

For Whooper Swan, Wigeon and Lapwing, the results did not provide evidence that treating the Brosna South Corridor as a separate high-activity zone was warranted. For example, using the 17 m viewsheds, Whooper Swan density was 161 birds/km²/month in the Brosna South Corridor compared with 191 in the remainder of the survey area, while the corresponding Wigeon densities were 212 and 1,058 birds/km²/month. The fact that the Brosna North Corridor had much higher densities does not provide evidence that similarly elevated densities occurred farther south along the river.

Avoiding unnecessary spatial subdivisions is also important because progressively dividing the survey area reduces the amount of flight activity and survey area contributing to each estimate, increasing uncertainty due to sampling effects. While sampling variability means that undetected spatial structure cannot be ruled out entirely, the spatial divisions used in the CRM were based on the observed flight activity data. There is therefore no evidence that combining the Brosna South Corridor with the remainder of the site for these species resulted in significant underestimation of collision risk.

4.13 RARE LARGE FLOCK OCCURRENCES

The GBWAG submission highlights the apparent discrepancy between the treatment of rare occurrences of large flocks of Black-tailed Godwit and Pintail.

4.13.1.1 Black-tailed Godwit

A flock of 1,750 Black-tailed Godwits occurred on one of the vantage point watches in February 2026. This record was included in the CRM because the flock was within a viewshed at potential collision height. The CRM report noted that this flock accounted for around 95% of the flight activity included in the model and discussed how to interpret this unusual event. This discussion acknowledged alternative scenarios:

If occurrences of large Black-tailed Godwit flocks at the proposed wind farm site are rare, the predicted collision risk is more appropriately interpreted as a plausible worst-case scenario rather than a reliable estimate of average risk.

Alternatively, the survey effort may have under-sampled the occurrence of large flocks, and that the recorded event reflects a more regular but infrequently detected pattern of site use.

The available data were insufficient to estimate the frequency with which such large flocks occur at the site or to meaningfully characterise sampling uncertainty. This uncertainty is inherent in datasets where activity is dominated by infrequent, high-magnitude events.

The GBWAG submission selectively quotes this discussion. It misrepresents the CRM report as recommending that the Black-tailed Godwit collision risk “should be interpreted with caution” as “a plausible worst-case scenario rather than a reliable estimate”, without acknowledging that the report also discussed the alternative underestimation scenario.

4.13.1.2 Pintail

The GBWAG submission refers to records of flocks of 200 Pintail in March 2024 and 34 Pintail in March 2026 and questions why an “individual CRM analysis” was not carried out.

Collision risk modelling uses data on flight activity at potential collision height within defined survey areas (viewsheds) collected during defined sampling events (vantage point watches).

The record of 200 Pintail in March 2024 involved birds feeding on a flooded area along the Little Brosna River for several hours. The record itself did not contain any recorded flight activity at potential collision height. It was mapped as a polygon and assigned a height of 2.5 m, which were common assignments used for non-flight records in the Ecology Ireland dataset. It therefore could not be included as flight activity in the CRM.

However, the occurrence of a flock of 200 Pintail for several hours indicates substantial use of this area. It is possible that the flock generated flight activity during arrival, departure or local movements that was not captured as timed flight activity within the parameters of the vantage point surveys. The available record provides no information on the duration, height or spatial distribution of any such activity. It would therefore not be methodologically valid to infer a quantity of flight activity at potential collision height from this observation for inclusion in the CRM.

The record of 34 Pintail in March 2026 was from a transect survey and also involved birds feeding along the Little Brosna River. As this was not a timed vantage point survey, it similarly cannot be used to derive the flight activity density required by the collision risk model.

The Pintail records therefore differ fundamentally from the February 2026 Black-tailed Godwit record. The latter comprised observed and timed flight activity at potential collision height within a CRM viewshed, and consequently contributed directly to the calculated flight activity density. The Pintail records document the presence of substantial flocks but do not provide the flight activity data required for collision risk modelling. Their exclusion from the CRM does not imply that the birds generated no flight activity, but there is no defensible basis for quantifying any unrecorded flight activity from these records.

Furthermore, the occurrence of a large flock does not in itself indicate that a correspondingly large amount of flight activity at potential collision height occurred. The amount of flight activity generated by a flock depends on its behaviour: the Black-tailed Godwit event involved prolonged observed flight activity, whereas the Pintail records involved birds feeding along the Little Brosna River. Although the Pintail flocks must have arrived at and departed from the area, the available data provide no basis for estimating the duration, height or location of those flights.

4.14 GOLDEN PLOVER AVOIDANCE RATE

The GBWAG submission criticises the use of a 99.6% avoidance rate for Golden Plover rather than the default 98% avoidance rate recommended for species without species-specific avoidance rates in the NatureScot guidance (NatureScot 2025b). This criticism is based on submissions made by NPWS in relation to other wind farm developments. The following

discussion is based on the summary of the NPWS criticisms presented in the GBWAG submission.

The 99.6% Golden Plover avoidance rate was derived from analyses of post-construction monitoring data from four English wind farms (two located adjacent to each other), carried out by the author of the Ballincor CRM (Gittings 2022). The reported NPWS critique has three grounds: the rate was derived from wind farms with substantially smaller turbine diameters than those proposed at Ballincor; these wind farms occurred in different landscape settings; and the NatureScot guidance states that its recommended avoidance rates will be updated when robust new information becomes available.

It is plausible that avoidance behaviour could be affected by turbine dimensions. However, there are plausible mechanisms by which increasing turbine size could result in either higher or lower overall avoidance rates, and there does not appear to be relevant empirical evidence demonstrating the direction or magnitude of any such effect. The potential for broad differences in landscape setting to influence avoidance rates is less apparent. Avoidance behaviour may, of course, vary between individual wind farm sites because of site-specific patterns of Golden Plover habitat use and flight activity. However, this does not imply systematic variation in avoidance rates between broader landscape settings, and the GBWAG submission does not identify either a mechanism or empirical evidence for such an effect.

More importantly, these issues are not specific to the Golden Plover avoidance rate. A review of the sources underlying the species-specific avoidance rates recommended by NatureScot (2025b) shows that most are based on monitoring undertaken at older wind farms, generally with substantially smaller turbines than those now proposed for modern wind farms, and in some cases in very different geographical and landscape contexts from typical Scottish or Irish wind farm sites (TABLE 4.2). Therefore, if differences in turbine dimensions or landscape setting were considered sufficient in themselves to invalidate transfer of an empirically derived avoidance rate, the same argument would substantially restrict the application of many of the species-specific avoidance rates currently recommended by NatureScot, despite the fact that NatureScot includes no such caveats in its guidance.

TABLE 4.2. DETAILS OF POST-CONSTRUCTION MONITORING STUDIES UNDERLYING THE SPECIES-SPECIFIC AVOIDANCE RATES RECOMMENDED BY NATURESCOT AND THE GOLDEN PLOVER AVOIDANCE RATE.

Species	Survey period	Number of wind farms	Turbine diameters	Location	Sources
Red-throated Diver	2007–2014	1		Orkney	1
Swans	2006–2007	1		The Netherlands	2
Geese	Pre-2006, 2009–2011	5		Bulgaria, United States	3
Red Kite	2007–2011	1	80 m	Scotland	4
Hen Harrier	Pre-2006	8		United States	5
Golden Eagle	Pre-2009	4	19.2–42 m	United States	6

Species	Survey period	Number of wind farms	Turbine diameters	Location	Sources
White-tailed Eagle	2008–2009	1	82 m	Norway	7
Great skua	2007–2012	3		Orkney	1
Large gulls	Pre-2013	7	34–92 m	England, Belgium, France, Poland	8
Small gulls	Pre-2013	3	82–92 m	England, Poland	8
Golden Plover	2006–2019	4	27–92 m	England	9

Sources: 1 = Furness (2015), 2 = Whitfield and Urquhart (2015), 3 = SNH (2013), 4 = Urquhart and Whitfield (2016), 5 = Whitfield & Madders (2006), 6 = Whitfield (2009), 7 = May *et al.* (2011), 8 = Cook *et al.* (2014) and Furness (2019), 9 = Gittings (2022).

While the NatureScot guidance states that its recommendations will be updated when robust new information becomes available, the history of previous revisions indicates that incorporation of new evidence into formal guidance can take a considerable period. The previous version of the guidance (SNH 2018) did not include species-specific avoidance rates for gulls, despite the research on which the rates in the current guidance are based (Cook *et al.* 2014) having been published four years previously. Scottish Natural Heritage subsequently commissioned a review of Cook *et al.* (2014), which was published by Furness (2019). However, a further six years elapsed before updated guidance incorporating avoidance rates for gulls was published (NatureScot 2025b). The absence of a species-specific rate from current guidance therefore does not necessarily indicate that relevant empirical evidence is unavailable or unsuitable.

Most importantly, the alternative 98% avoidance rate is not an empirically derived Golden Plover avoidance rate based on larger turbines, more recent wind farms or more comparable landscape settings. It is a generic default intended for species for which a species-specific rate is unavailable. Uncertainty concerning the transferability of empirical avoidance rates between turbine designs or landscape settings does not, in itself, provide an evidential basis for preferring that generic default over the available species-specific Golden Plover evidence.

Furthermore, uncertainty about transferability does not establish that the 99.6% avoidance rate is biased upwards, much less that 98% is closer to the true value. That is important because dropping from 99.6% to 98% multiplies predicted residual collision mortality five-fold. Such a large adjustment requires some evidential basis; it should not follow merely from identifying an unquantified uncertainty in the empirical estimate.

The 99.6% rate used in the Ballincor CRM therefore represents the available empirical evidence specifically for Golden Plover and was applied on that basis. Using the generic 98% default would not resolve uncertainty concerning the transferability of avoidance rates to modern turbine designs. Instead, it would replace an empirically derived species-specific parameter with a generic value for which there is no equivalent empirical justification for Golden Plover.

4.15 UNCERTAINTY

The GBWAG submission raises a number of issues about the treatment of uncertainty in the CRM. However, the submission does not always distinguish between uncertainties that are inherent in collision risk modelling, uncertainties associated with the underlying survey data, and uncertainties that were specifically identified and quantified in the Ballincor CRM. In several cases, uncertainties that were explicitly investigated and reported in the CRM are described as “self-identified gaps”, when their identification and quantification represent additional analysis beyond that normally undertaken in collision risk modelling.

4.15.1.1 Distance effects

Distance effects are a significant potential issue in the use of vantage point survey data for collision risk modelling as has been highlighted in research published and presented at conferences by the author of the Ballincor CRM (Gittings 2023, 2024a, 2024b). This research shows that distance effects are likely to occur in all vantage point survey datasets, despite the fact that most collision risk modelling does not acknowledge their existence.

While they are acknowledged in the vantage point survey guidance (NatureScot 2025a), the collision risk modelling methodology (Band 2024, NatureScot 2024) does not include any procedures to correct for their effects. The approach taken in the Ballincor CRM was to follow the NatureScot collision risk modelling methodology, but to include the distance effects as an uncertainty factor. Table 4.6 of the CRM report includes correction factors to adjust for under-detection of distant flightlines for all the species included in the collision risk assessment. Again, following the NatureScot collision risk modelling methodology, these correction factors were not included in the calculations of overall uncertainty factors, but were referenced in both the discussion of overall uncertainty (Section 4.7.5 of the report) and the collision risk assessment (Section 5.3 of the report).

Despite this detailed treatment of distance effects, the GBWAG submission seems to imply that these effects and their implications for the collision risk predictions were not adequately treated in the CRM.

The under-detection due to distance effects is included in Section 4.3.11 of the submission as one of the “CRM Self-Identified Gaps”. However, this seems to imply that it is an issue unique to this CRM, whereas in fact it is an issue likely to be common to all CRMs, whether they acknowledge it or not. What distinguishes the Ballincor CRM from most collision risk modelling is that distance effects are explicitly investigated and the potential underestimation of collision risk due to these effects is quantified.

The submission criticises the use of 2 km viewsheds on the basis that 1 km viewsheds are more likely to produce more accurate vantage point survey results. However, the correction factors are designed to account for this issue by reducing the effective viewshed area, thereby increasing the estimated flight activity density, in each viewshed in proportion to the distribution of the viewshed areas between each distance band and the relative detection rates between the bands.

The submission’s discussion of flight activity along the Brosna corridors show a misunderstanding of the objectives of the distance effects analysis. It cites the example of a bird “flying at 2.5m above a watercourse at 800–1,000 m range from a VP” as being “substantially harder to detect than a bird flying at 100 m in open airspace at the same range” as showing that

the correction factors “are not calibrated to the low-altitude corridor flights that dominate the North Corridor”. However, the distance effects analyses deliberately exclude low altitude flights and are restricted to flights that occurred at height above the viewshed elevation. This restriction is necessary because the purpose of the analysis was to isolate the effect of distance on detection probability. Flights below the mapped viewshed elevation are additionally affected by spatial variation in visibility, which would confound the estimation of distance effects. The influence of the Brosna corridors was detected in the distance effects analysis, causing interruptions in the smooth distance-decay relationship before the flight activity from the corridor was removed to generate the correction factors used in the uncertainty analyses.

4.15.1.2 Sampling effects uncertainty

The GBWAG submissions quotes part of the discussion about the reduction in sampling effects uncertainty with increasing number of survey seasons and states that “the CRM's own analysis shows that the dominant source of uncertainty is not how many seasons were surveyed but the quality of data within each season”. This shows a fundamental misunderstanding of what the sampling effects analysis measures. The analysis quantifies the variability in estimated flight activity arising from sampling a small proportion of an inherently variable distribution of flight events. It does not quantify systematic biases associated with the temporal distribution or other aspects of the survey coverage. The reason for the reduction in uncertainty with increasing number of survey seasons in the analyses presented in the CRM is simply due to increasing sample sizes. With rare events, such as flight records during vantage point watches, such increases can cause large reductions in variability even when the record rate remains constant due to increases in the absolute numbers of records sampled.

The simulation model used to analyse sampling effects uncertainty did not differentiate between the Ecology Ireland and TOBIN datasets but used the combined datasets to generate the record rate, flock size and flight duration datasets used to parameterise the model. Therefore, the model's results cannot say anything about the effects of differences in the survey coverage between the two datasets on sampling effects variability. Diel coverage could introduce an additional source of bias, but this is conceptually distinct from the sampling variability quantified by the simulation model. The characterisation in the GBWAG submission that “adding more Ecology Ireland seasons does not reduce [the sampling effects] uncertainty” while “the TOBIN season reduces it for one winter” is not supported by the model structure or results and is a misrepresentation of the implications of the model.

4.15.1.3 Avoidance rate uncertainty

As with distance effects, avoidance rate uncertainty is included as one of the “CRM Self-Identified Gaps” in Section 4.3.11, despite the fact that this is a common issue for all CRMs.

The submission also states that “uncertainty due to avoidance rate uncertainty is excluded from the reported ranges”. This is correct in the limited sense that avoidance-rate uncertainty was not incorporated into the combined uncertainty ranges in Tables 4.7 and 4.8. However, it is misleading if intended to imply that the implications of avoidance-rate uncertainty were not quantified or presented.

Table 4.9 of the CRM report presents the collision risk generated by the four specific avoidance rates included in the spreadsheet implementation of the NatureScot CRM (95–99.5%). Table

4.9 therefore provides a direct sensitivity analysis of the collision predictions to alternative avoidance-rate assumptions.

Following the NatureScot collision risk modelling methodology, the avoidance rate uncertainty was not included in the calculations of overall uncertainty factors, but was referenced in both the discussion of overall uncertainty (Section 4.7.5 of the report) and the collision risk assessment (Section 5.3 of the report). It should also be noted that the effect of varying the avoidance rate can be easily calculated as the ratio of the non-avoidance rates: e.g. increasing the avoidance rate from 98% to 99% reduces the collision risk by a factor of $(1 - 0.99) / (1 - 0.98) = 0.5$.

4.15.1.4 The 1% threshold

The GBWAG submission raises a number of issues about the use and interpretation of the 1% threshold, and other criteria, for assessing the potential significance of the predicted collision risk. However, the submission misunderstands what the 1% threshold represents and misrepresents its use in the CRM report.

The collision risk assessment in the CRM used the potential increase in annual mortality as a percentage of background annual mortality to assess the potential significance of the predicted collision risk. The 1% threshold therefore represents additional mortality equivalent to 1% of the population's existing annual background mortality. It does not represent mortality of 1% of the population. For the Irish White-tailed Eagle population, which is the example given by the GBWAG submission, using the quoted population figure of 150 birds, 1% of the population is 1.5 birds, as quoted on page 614 of the submission. However, assuming an adult survival rate of 0.936, annual background mortality would be $150 \times (1 - 0.936) = 9.6$ birds, and the 1% threshold would therefore be $9.6 \times 0.01 = 0.096$ birds/year. The threshold actually used in the CRM is therefore over an order of magnitude lower, and substantially more precautionary, than the 1.5 birds figure discussed by the GBWAG submission.

The discussion of the 1% threshold in the CRM report refers to the fact that it may be biologically implausible for small populations with low mortality rates without discussing this issue in detail. Unfortunately this statement has also been misinterpreted by the GBWAG submission. The statement was referring to very small populations where strict application of the 1% threshold would result in extremely low collision rates being identified as potentially significant. For example, for the Irish Golden Eagle population of five territorial pairs (ten territorial adults) in 2018 (Burke *et al.* 2020), and assuming an annual survival rate of 0.95, the 1% threshold would be 0.005 collisions/year, equivalent to one collision every 200 years. This is also at the limit of the numerical precision of the standard NatureScot collision risk model output, which reports predicted collision rates to two decimal places. Predicted rates below this level are therefore reported as 0.00 collisions/year. This illustrates why strict application of the 1% threshold can cease to provide a biologically meaningful criterion for very small populations with low background mortality rates. However, this issue was not expanded on in the CRM report because it was not relevant to any of the populations that were assessed.

The submission also implies that either the 1% threshold, or a threshold of at least ten records during the vantage point surveys, was used to select the populations included in the collision risk assessment. This is not correct. The ten records threshold was only used to select species for inclusion in the analyses of seasonal and monthly record rates in Tables 3.6 and 3.7, so as to avoid the tables being swamped by species for which these analyses would not be meaningful.

The 1% threshold was applied after populations had been selected for the collision risk assessment.

The main criterion for selecting populations for the collision risk assessment was that the predicted collision risk would generate at least one collision within the operational lifespan of the wind farm. This criterion was based on the experience of the author with carrying out and reviewing population modelling where collision rates below one collision per operational lifespan of a wind farm would not be expected to produce a detectable difference between impacted and baseline population trajectories for populations numbering hundreds or more. An additional criterion was that relevant population data needed to be available.

The GBWAG submission criticises the “repeated invocation” of “the phrase ‘the 1% threshold is likely to be very precautionary’” in the CRM report. However, the report explains the rationale for this statement, and the submission does not engage with that rationale. Furthermore, the calculation of increases in mortality rates also incorporated precautionary assumptions, which are also detailed in the CRM report. The conclusion that “substantial increases in annual mortality well above the 1% threshold are likely to be required to cause significant impacts on the affected populations” is therefore based on explicit arguments presented in the report that have not been challenged by the GBWAG submission. However, the CRM report does not state that exceedance of the 1% threshold should be ignored. On the contrary, populations for which either the central collision risk estimate or the upper uncertainty limit exceeded the 1% threshold were explicitly identified in the collision risk assessment.

The submission also suggests that the 1% threshold is not relevant for local SPA populations that are in unfavourable condition where the question the assessment should address is “whether the development undermines the population's potential for recovery to favourable conservation status”. The submission is correct that, for an SPA population in unfavourable condition, the relevant outcome is whether the development could undermine the population's potential to recover to favourable conservation condition. However, this does not mean that any additional mortality is biologically significant. The magnitude of the additional mortality needs to be assessed in relation to the dynamics of the affected population.

The only way that collision mortality can affect the population's recovery potential is through its contribution to the population's overall mortality rate. Quantifying the predicted increase in mortality is therefore directly relevant to assessing that outcome. The 1% threshold is not itself the conservation objective, nor was it treated as an absolute boundary between significant and non-significant effects; it provides a precautionary benchmark for interpreting whether the magnitude of additional mortality is likely to warrant concern at population level.

4.16 KESTREL

A separate issue relevant to the collision risk assessment is raised in the submission from Shane and Mary Hctor. This submission refers to a Kestrel breeding site in their property around 1.5 km from the nearest turbine (T08). The submission claims that, because the breeding site was not identified in the EIAR, the collision risk generated by Kestrels from that breeding site “has not been assessed”.

The CRM assessed the collision risk to Kestrels, and all other target species, using all the data on flight activity at potential collision height generated by the vantage point surveys. As is standard

practice with CRM, the modelling did not consider specific nest sites separately but calculated the overall collision risk across the wind farm site, or sub-sections of the site for the spatially-structured surveys.

The data used for the CRM included around nine bird-hours of Kestrel flight activity for the 17 m viewshed model, and six bird-hours for the 30 m viewshed model. This included 0.9–1.2 bird-hours from the EI1 VP and 0.3–0.5 bird-hours from the TB3 VP, which were the main vantage points covering the T08 turbine location. Therefore, if Kestrels from the Hoctors' breeding site were using habitat within the wind farm site, their activity would have formed part of the flight activity sampled by the vantage point surveys. The identification of an additional breeding site does not therefore represent a previously unmodelled source of collision risk in the way implied by the submission

Kestrel was one of the species included in the collision risk assessment, which assessed the potential significance of the predicted collision risk to its national and County Offaly populations. No assessment was made at a local scale because for a widespread but dispersed species defining a local population would not be meaningful.

4.17 MISSING SPECIES

The GBWAG submission highlights a number of species that were not included in the detailed collision risk assessment, which it considers warranted detailed assessment due to their national rarity or status as Qualifying Interests of the River Little Brosna SPA. These species were included in the collision risk modelling where flight activity at potential collision height was recorded, but their predicted collision risks were sufficiently low that they were not taken forward for detailed population-level assessment.

The missing species highlighted by the submission for which the CRM generated non-zero collision risk predictions are discussed below. Other species highlighted by the submission were not included in the CRM because they were not recorded at potential collision height during the vantage point surveys and/or because vantage point surveys are not an effective way of sampling their flight activity.

4.18 INCREASES IN MORTALITY RATES

Table 4.3 shows the potential increases in annual mortality rates to the national and (where relevant) River Little Brosna SPA populations of the species listed in Section 4.5 of the GBWAG submission, excluding species already covered in the collision risk assessment in the CRM report and species that had zero collision risk reported in the CRM. In all cases, the potential increases were below 1%. For most species they were negligible (<0.05%), while the highest value was 0.4% for White-tailed Eagle with the N163 turbine. These calculations therefore confirm that taking these species forward into a more detailed population-level assessment would not have changed the conclusions of the CRM.

Table 4.3. Potential increases in annual mortality rates due to the predicted collision risk from the Ballincor Wind Farm.

Species	Population	Scale	Turbine		
			N149	N163	V150
Greenland White-fronted Goose	non-breeding	national	0.0%	0.0%	0.0%
		SPA	0.0%	0.0%	0.0%

Teal	non-breeding	national	0.0%	0.0%	0.0%
		SPA	0.0%	0.0%	0.0%
Pintail	non-breeding	national	0.0%	0.0%	0.0%
		SPA	0.0%	0.0%	0.0%
White-tailed Eagle	breeding	national	0.2%	0.4%	0.2%
Hen Harrier	breeding	national	0.0%	0.1%	0.0%
Curlew	breeding	national	0.1%	0.1%	0.1%
Merlin	breeding	national	0.0%	0.0%	0.0%
Peregrine	breeding	national	0.0%	0.0%	0.0%

Population size sources: Greenland White-fronted Goose, Teal and Pintail = Burke *et al.* (2025); White-tailed Eagle = www.npws.ie/news/white-tailed-eagle-reintroduction-programme-marks-successful-completion-final-release-chicks; Hen Harrier = Ruddock *et al.* (2024); Curlew = Colhoun *et al.* (2022); Merlin = NPWS (2013); Peregrine = Wilson-Parr and O'Brien (2017); all-Ireland figures and lower end of ranges used where relevant. Survival rates from www.bto.org/learn/about-birds/birdfacts; adult survival rates used in all cases.

4.19 WHITE-TAILED EAGLE

The highest potential increase was for White-tailed Eagle reflecting its relatively low avoidance rate. While White-tailed Eagle has a small Irish population (recently reported as around 150 birds), the birds are very mobile and range widely across Ireland. It is not unusual for wind farm vantage point surveys to record White-tailed Eagles, even when the sites are not close to breeding locations. Therefore, the occurrence of White-tailed Eagles in the vantage point surveys does not indicate that the wind farm site supports a discrete local population or that the predicted collision mortality should be assessed against a smaller local population.

4.20 HEN HARRIER

The GBWAG submission suggested that there was linkage between the wind farm site and the Slieve Bloom Mountains SPA Hen Harrier population on the basis that Hen Harriers from the latter area might occur in the wind farm site during winter. However, as the submission itself notes, Hen Harriers range widely in winter. Birds occurring at Ballincor could therefore originate from several breeding populations, while birds breeding in the Slieve Bloom Mountains SPA may disperse to wintering areas elsewhere in Ireland. Attributing the winter Hen Harrier collision mortality from the Ballincor Wind Farm to the Slieve Bloom Mountains SPA population assumes a degree of linkage for which there is no evidence.

4.21 CURLEW AND MERLIN

The submission suggests that the Curlew and Merlin collision risk may be under-estimated due to the issues with diel survey coverage. While the likely degree of bias is exaggerated, some bias may occur with Curlew (see Section 4.4). For Merlin, a more likely source of bias is its limited detectability in vantage point surveys (Lusby *et al.* 2011). However, Merlin frequently forage close to the ground, so much of this unrecorded activity is also likely to be below potential collision height.

The submission also highlights recent breeding records of both species in the vicinity of the wind farm site. Breeding evidence of Curlew was recorded in the Arragh More Bog NHA / Kilcarren-Firville Bog SAC area (over 4 km west of the nearest proposed turbine) and in the

Ballyduff/Clonfinnane Bog SAC (over 3.5 km north of the nearest proposed turbine). Merlin was recorded breeding in the Ballyduff/Clonfinnane Bog SAC. The Arragh More Bog NHA / Kilcarren-Firville Bog SAC area is over 4 km west of the nearest proposed turbine, and the Ballyduff/Clonfinnane Bog SAC over 3.5 km north of the nearest proposed turbine, while the actual distances from the Curlew and Merlin breeding sites may be much greater as they are unlikely to be at the closest point of the boundaries of these sites.

SNH (2016) defines the likely core foraging range of Curlew from its nest site as 1 km with a maximum range of 2 km. GPS-tracking studies in Donegal, Wales and Scotland have similarly shown that breeding Curlew activity is generally concentrated relatively close to nest sites (Ewing *et al.* 2017, Bowgen *et al.* 2022, Whitelaw *et al.* 2024). While some degree of connectivity between the wind farm site and these breeding Curlew sites cannot be ruled out, frequent movements between the sites seem unlikely.

The Merlin foraging range defined by SNH (2016) is “within 5 km”. This is not defined as a core foraging range so the exact interpretation of this distance is ambiguous. Nevertheless, connectivity between the Ballyduff/Clonfinnane Bog SAC Merlin breeding site and the wind farm site seems more likely than for the Curlew breeding sites.

However, potential connectivity with a breeding territory is not equivalent to significant collision exposure. Generation of appreciable collision risk requires frequent flight through the turbine rotor-swept volume at potential collision height. For the turbine models considered in the CRM, a predicted collision rate of one Curlew or Merlin per year would require around 950–1100 transits of the rotor space⁴⁵. Furthermore, rotor-swept volumes occupy only a small proportion of the airspace surveyed by the vantage points, so generating 950–1100 rotor transits would require a much larger amount of flight activity across the wind farm site. Occasional visits by Curlews to areas outside their core foraging ranges seem unlikely to generate the required level of flight activity. Similarly, while connectivity between the Ballyduff/Clonfinnane Bog SAC Merlin breeding site and the wind farm site is plausible, its distance from the proposed turbines, combined with the likely predominance of low-level foraging activity, means that such connectivity would not necessarily generate high levels of flight activity at potential collision height.

4.22 CONCLUSIONS ABOUT THE MISSING SPECIES

Overall, the additional calculations in Table 1.3 confirm that the species highlighted by the GBWAG submission have very low predicted collision risks relative to the relevant populations. There are uncertainties in the extent to which vantage point surveys detected activity by some of these species, particularly Merlin, and some connectivity with nearby breeding sites cannot be excluded. However, neither occasional occurrence nor potential connectivity demonstrates the high levels of flight activity at potential collision height that would be required to generate appreciable collision mortality. These considerations do not alter the conclusions of the collision risk assessment.

⁴⁵ These figures are based on the single transit collision risks for pitch values of 15° in Table A1.6 in the CRM report, avoidance rates of 98% and operational percentages of 85%.

APPENDIX 2 – LIST OF OBSERVERS

Prescribed Bodies

Offaly County Council
Tipperary County Council
Department of Defence
Department of Housing, Local Government and Heritage
Inland Fisheries Ireland
Irish Aviation Authority
National Environmental Health Service
Transport Infrastructure Ireland
Uisce Éireann

Third Party Submissions

Adrian Hocter
Airidas & Brigita Dzimids
Ann Hassett
Anne Davis
Birr Outdoor Education & Training Centre co Mary Clarke
Blathnaid and Kevin Purcell
Brian Kelly
Carmel, Bernard & Damian Larkin
Carol and Cathal Miller
Carrig National School
Cathal Flynn
Clondallow Residents co Rita Frawley
Colm Wright
Colman Hogan
David and Ann Calvert
David Cleary & Megan Curran
Declan Mann
Deputy John Clendennen
Dermot Ward
Dominic Slevin
Ealga Lodge Nursing Home
Elizabeth Burke

Emmett Scanlon and Philip Dodd
Enda Mannion
Eoin & Johanna Doorley
Eugene Power
Gerry & Sinead Mahon
Greater Birr Wind Action Group
Hazel Perdue
Irish Road Haulage Association
Jacqueline Stephens
Jason & Noelle Tooher
Joan Mary Smith
Joe O'Connor
John Ryan
Kearns Transport co Francis Kearns
Killeen National School
Laura Dargan
Lee Deane
Liam Egan
Low Frequency Array European Research Infrastructure - Dublin Institute for Advanced Studies
Marian Egan-Harvey
Mary Drumm-Egan
Michael & Anne O'Connor
Michael Costello
Michael Hunt
Michele, Denise & Niamh O'Brien
Nichola Culleton
Nicky Joynes
Pat Mann
Patrick & Barbara Ann Headon
Paul Johnston
Paul Mann
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APPENDIX 3 – ECOLOGICAL MEMORANDUM

Ecological Memorandum

Project: Ballincor Wind Farm, Co. Offaly and Co. Tipperary.

Purpose: Historic active transect surveys from 2020 and 2021.

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Date: 24th August 2026.

1. Introduction

O'Donnell Environmental have prepared the following ecological memorandum detailing the methodology and results of historic active transect surveys undertaken for the proposed Ballincor Wind Farm between 2020 and 2021. The surveys were carried out by O'Donnell Environmental on behalf of Ecology Ireland. The current ecological memorandum was prepared in response to the following submission provided by the Department of Housing, Local Government and Heritage on the Bat Survey Report (O'Donnell Environmental, 2026):

“Only one activity bat survey was undertaken in late September 2025 along the proposed grid connection route. Whilst static detectors are useful in identifying the species utilising the site, they are also limited to specific locations and do not identify flight paths or foraging hot spots.....Activity surveys should have been carried out along areas of suitable foraging and commuting habitat... as per best practice guidance (BCT, 2024)”

2. Methodology

Active transects were undertaken on two occasions on 22nd September 2020 and 16th September 2021 following relevant guidance at the time of surveys (Collins, 2016). Transects were completed by two surveyors during compliant weather conditions. The aim of the survey was to identify any flight-lines which may be apparent, and to identify any behaviour which would indicate the presence of a roost nearby. Each transect was walked at least once during each survey, with the exception of Transect 5 in 2021. Additional survey areas were covered on this occasion (see **Figure 2.1**). The locations of transects were originally designed based upon the turbine layouts that were current at that time. Transect routes utilised existing access tracks through the proposed development, as the majority of turbine locations at the time of survey were located within bogland habitat and was thus not suitable or safe for walked transects at night. Wildlife Acoustics full-spectrum Echo Meter Touch 2 Pro handheld detectors were used to record activity.

3. Results

A total of 90 registrations were recorded on 22nd September 2020 across five (possibly six) species due to the presence of *Myotis* sp. (see **Figure 3.1**), which could not be identified to species level. Activity was dominated by the common and widespread species of Common Pipistrelle and Soprano Pipistrelle. Leisler's Bat was not recorded on this occasion. The earliest registration was from Soprano Pipistrelle approximately 30 minutes after sunset along Transect 1. As the night progressed, activity concentrations were recorded along hedgerow habitat of Transect 3, and particularly surrounding the woodland habitat of Transects 4 and 5. Brown long-eared Bat was only recorded along Transect 3. The *Myotis* species of Whiskered Bat and Daubenton's Bat were similarly only recorded along Transect 5.

A total of 10 registrations were recorded on 16th September 2021 across three species despite suitable weather conditions, a marked contrast to the previous survey (see **Figure 3.2**). The earliest registration

was of *Myotis* sp. approximately 45 after sunset along the extended version of Transect 1 near Ballincor House. Following this, activity was only recorded along Transects 1 and 2 and consisted of Soprano Pipistrelle and Leisler's Bat only. As the night progressed, no registrations were recorded along the remaining transects despite the presence of suitable landscape features and foraging habitat.

4. Discussion

Active transect surveys were carried out and discontinued as it was deemed unnecessary and did not provide any additional meaningful ecological context in the current instance. The current ecological memorandum presents the methodology and results of these historic active transect surveys undertaken for the proposed Ballincor Wind Farm in 2020 and 2021 based on design information at the time.

The active transect results are reflective of our current understanding the site based on an extensive, multi-annual passive bat monitoring survey effort. The same bat species were recorded, in similar proportions. Activity was similarly concentrated in locations along hedgerows and mature woodland as identified during passive monitoring and are reflected within the original report.

The active transect data presented herein is considered historic data and expired following CIEEM (2019) and was thus not included within the original Bat Survey Report (O'Donnell Environmental, 2026). Following the completion of these historic transect surveys, Northern Irish guidance was released in the interim that places a lesser emphasis on transect surveys, and provisions the decision of such on the professional judgement of the commissioned Ecologist (NIEA, 2022).

5. References

- CIEEM (2019). Advice Note on the Lifespan of Ecological Reports and Surveys. Chartered Institute of Ecology and Environmental Management, Winchester.
- Collins J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London.
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- Roche, N., Langton, S. and Aughney T. (2012) Car-based bat monitoring in Ireland 2003-2011. Irish Wildlife Manuals, No. 60. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

